

# Appendix A

## Compliance & Acceptance Forms

Certificate of Compliance Forms and Worksheets			
Envelope	Mechanical	Lighting	Outdoor Lighting
<b>ENV-1-C</b> Certificate of Compliance  <b>ENV-2-C</b> Envelope Component Method  <b>ENV-3-C</b> Overall Envelope Method  <b>ENV-4-C</b> Skylight Area Support Worksheet	<b>MECH-1-C</b> Certificate of Compliance  <b>MECH-2-C</b> Air System, Water Side System, Service Hot Water & Pool Requirements  <b>MECH-3-C</b> Mechanical Ventilation  <b>MECH-4-C</b> HVAC Misc. Prescriptive Requirements	<b>LTG-1-C</b> Certificate of Compliance  <b>LTG-2-C</b> Indoor Lighting Schedule <b>LTG-3-C</b> Portable Lighting Worksheet  <b>LTG-4-C</b> Lighting Controls Credit Worksheet  <b>LTG-5-C</b> Indoor Lighting Power Allowance  <b>LTG-6-C</b> Tailored Method Worksheet  <b>LTG-7-C</b> Room Cavity Ratio Worksheet  <b>LTG-8-C</b> Common Lighting Systems Method  <b>LTG-9-C</b> Line Voltage Track Lighting Worksheet	<b>OLTG-1-C</b> Certificate of Compliance  <b>OLTG-2-C</b> Lighting Compliance Summary  <b>OLTG-3-C</b> Illuminated Area Calculation Worksheet  <b>OLTG-4-C</b> Sign Lighting Compliance
Certificate of Acceptance Forms and Worksheets			
	Mechanical		Outdoor Lighting
	<b>MECH-1-A</b> Certificate of Acceptance  <b>MECH-2-A</b> Ventilation Systems – Variable and Constant Volume  <b>MECH-3-A</b> Packaged HVAC Systems  <b>MECH-4-A</b> Economizer  <b>MECH-5-A</b> Air Distribution  <b>MECH-6-A</b> Demand Control Ventilation  <b>MECH-7-A</b> Supply Fan VFD  <b>MECH-8-A</b> Hydronic Systems Control		<b>LTG-1-A</b> Certificate of Acceptance  <b>LTG-2-A</b> Lighting Controls  <b>LTG-3-A</b> Automatic Daylighting

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# 2005 Compliance Forms

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# Envelope Forms - Compliance

# CERTIFICATE OF COMPLIANCE (Part 1 of 2)

**ENV-1-C**

PROJECT NAME		DATE
PROJECT ADDRESS		Building Permit #
PRINCIPAL DESIGNER-ENVELOPE	TELEPHONE	
DOCUMENTATION AUTHOR	TELEPHONE	Checked by/Date Enforcement Agency Use

**GENERAL INFORMATION**

DATE OF PLANS	BUILDING CONDITIONED FLOOR AREA	CLIMATE ZONE
<b>BUILDING TYPE</b>	<input type="checkbox"/> NONRESIDENTIAL	<input type="checkbox"/> HIGH-RISE RESIDENTIAL
	<input type="checkbox"/> HOTEL/MOTEL GUEST	
	<input type="checkbox"/> RELOCATABLE – Indicate: <input type="checkbox"/> specific climate – list _____, or <input type="checkbox"/> all climates	
<b>PHASE OF CONSTRUCTION</b>	<input type="checkbox"/> NEW CONSTRUCTION	<input type="checkbox"/> ADDITION <input type="checkbox"/> ALTERATION
	<input type="checkbox"/> UNCONDITIONED (file	
<b>METHOD OF ENVELOPE COMPLIANCE</b>	<input type="checkbox"/> COMPONENT	<input type="checkbox"/> OVERALL ENVELOPE
<b>SUPPORTING FORMS SUBMITTED</b>	<input type="checkbox"/> ENV-2-C (Component)	<input type="checkbox"/> ENV-3-C (Overall Envelope)
	<input type="checkbox"/> ENV-4-C (Skylight Worksheet)	

**STATEMENT OF COMPLIANCE**

This Certificate of Compliance lists the building features and performance specifications need to comply with Title 24, Parts 1 and 6 of the California Code of Regulations. This certificate applies only to building envelope requirements.

The documentation preparer hereby certifies that the documentation is accurate and complete.

DOCUMENTATION AUTHOR	SIGNATURE	DATE
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The Principal Envelope Designer hereby certifies that the proposed building design represented in this set of construction documents is consistent with the other compliance forms and worksheets, with the specifications, and with any other calculations submitted with this permit application. The proposed building has been designed to meet the envelope requirements contained in sections 110, 116 through 118, and 140, 142, 143 or 149 of Title 24, Part 6. **Please check one:**

- ☐ I hereby affirm that I am eligible under the provisions of Division 3 of the Business and Professions Code to sign this document as the person responsible for its preparation; and that I am licensed in the State of California as a civil engineer or mechanical engineer, or I am a licensed architect.
- ☐ I affirm that I am eligible under the provisions of Division 3 of the Business and Professions Code by section 5537.2 or 6737.3 to sign this document as the person responsible for its preparation; and that I am a licensed contractor performing this work.
- ☐ I affirm that I am eligible under Division 3 of the Business and Professions Code to sign this document because it pertains to a structure or type of work described as exempt pursuant to Business and Professions Code Sections 5537, 5538 and 6737.1.

(These sections of the Business and Professions Code are printed in full in the Nonresidential Manual.)

PRINCIPAL ENVELOPE DESIGNER-NAME	SIGNATURE	DATE	LIC. #

**ENVELOPE MANDATORY MEASURES**

Indicate location on plans of Note Block for Mandatory Measures \_\_\_\_\_

**INSTRUCTIONS TO APPLICANT ENVELOPE COMPLIANCE & WORKSHEETS (check box if worksheet is included)**

For detailed instructions on the use of this and all Energy Efficiency Standards compliance forms, please refer to the Nonresidential Manual published by the California Energy Commission.

<input type="checkbox"/> ENV-1-C	Certificate of Compliance. Required on plans for all submittals. Part 2 may be incorporated in schedules on plans.
<input type="checkbox"/> ENV-2-C	Use with the Envelope Component compliance method.
<input type="checkbox"/> ENV-3-C	Use with the Overall Envelope compliance method.
<input type="checkbox"/> ENV-4-C	Optional. Use for the minimum skylight requirements for large enclosed spaces.

# CERTIFICATE OF COMPLIANCE

(Part 2 of 2)

ENV-1-C

PROJECT NAME

DATE

## OPAQUE SURFACES

Surface Type	Area	U-factor	Insulation Cavity	Insulation Continuou	Actual Azimuth	Tilt	Condition Status*	Joint App IV Reference	Location/Comments (e.g., Suspended Ceiling, Demising, etc.)	NOTES TO FIELD For Building Use Only

\* N, E, A, (New, Existing, Altered)

## FENESTRATION SURFACES

✓ ☐ More than or equal to 10,000 ft<sup>2</sup> of site-built fenestration area must include a label certificate issued by NFRC or provide a CEC Default Label Certificate using the default U-factors from Standards Tables 116-A and B. Certificate shall be filed in the contractor's project office during construction and in the building manager's office after construction.

A	B	C	D	E	F	G	H	I	J	K
Fen. #	Fenestration Type	Area	Azimuth	U-factor	U-factor Type <sup>1</sup>	Fenestration SHGC	SHGC Type <sup>2</sup>	Condition Status <sup>3</sup>	Location / Comments	NOTES TO FIELD – For Bldg. Dept. Use Only

<sup>1</sup> U-factor Type: D, A or N (D for Default Table from Section 116, A for ACM Manual Appendix Default Table, or N for NFRC Labeled)

<sup>2</sup> SHGC Type: D, C or N (D for Default Table from Section 116, C for Center of Glass, or N for NFRC).

<sup>3</sup> Condition Status: N, E, or A (New, Existing, or Altered)..

## EXTERIOR SHADING

Fenestration No.	Exterior Shade Type	SHGC	Window		Overhang			
			Height	Width	Length	Height	LExt.	RExt.

## MINIMUM SKYLIGHT AREA FOR LARGE ENCLOSED SPACES

✓ ☐ The proposed building contains an enclosed space with floor area greater than 25,000 ft<sup>2</sup>, a ceiling height greater than 15 feet, and an LPD for general lighting of at least 0.5 W/ft<sup>2</sup>. **If this box is checked, ENV-4-C must be filled out.**

NOTES TO FIELD - For Building Department Use Only

# ENVELOPE COMPONENT METHOD

(Part 1 of 2)

ENV-2-C

PROJECT NAME

DATE

## WINDOW AREA CALCULATION

A. DISPLAY PERIMETER

FT × 6 FT =

SF

DISPLAY AREA

B. GROSS EXTERIOR WALL AREA

SF × 0.40 =

SF

40% of GROSS EXTERIOR WALL AREA

C. ENTER LARGER OF A OR B

SF

MAXIMUM STANDARD AREA

D. ENTER PROPOSED WINDOW AREA

SF

PROPOSED WINDOW AREA

If the PROPOSED WINDOW AREA is greater than the MAXIMUM STANDARD AREA then the envelope component method may not be used.

E. WINDOW WALL RATIO = Proposed Window Area Divided by Gross Exterior Wall Area =

F. WEST DISPLAY PERIMETER

FT × 6 FT =

SF

WEST DISPLAY AREA

G. WEST EXTERIOR WALL AREA

SF × 0.40 =

SF

40% of WEST EXTERIOR WALL AREA

H. ENTER THE LARGER OF F AND G

SF

MAXIMUM STANDARD WEST AREA

I. ENTER PROPOSED WEST WINDOW AREA

SF

PROPOSED WEST WINDOW AREA

If the PROPOSED WEST WINDOW AREA is greater than the MAXIMUM STANDARD WEST AREA then the envelope component method may not be used.

J. WEST WINDOW WALL RATIO = Proposed West Window Area Divided by West Exterior Wall Area =

## SKYLIGHT AREA CALCULATION

A. ATRIUM or SKYLIGHT HEIGHT

FT

GROSS ROOF AREA

STANDARD ALLOWED SKYLIGHT AREA

B. IF Atrium/Skylight Height in A ≤ 55 FT

SF × 0.05 =

SF

C. IF Height in A > 55 FT

SF × 0.10 =

SF

D. PROPOSED SKYLIGHT AREA

SF

If the PROPOSED SKYLIGHT AREA is greater than the STANDARD ALLOWED SKYLIGHT AREA then the envelope component method may not be used.

## SKYLIGHTS

SKYLIGHT NAME (e.g., Sky-1, Sky-2)	SKYLIGHT GLAZING			# OF PANES	U-FACTOR		SOLAR HEAT GAIN COEFFICIENT	
	✓ With Curb	✓ With No Curb	✓ Plastic		PROPOSED	ALLOWED	PROPOSED	ALLOWED
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					

## RELOCATABLE PUBLIC SCHOOL BUILDINGS - See §143(a)8 in the Energy Standards

☐ For Specific Climate Zone, use Table 143-A - Prescriptive Envelope Criteria.

☐ Specific Climate Zone Metal Identification Label – Place two labels on each relocatable building and indicate on the building plans.

☐ For Any (All) Climate Zone, use Table 143-C - Prescriptive Envelope Criteria.

☐ Any (All) Climate Zone Metal Identification Label - Place two labels on each relocatable building and indicate on the building plans.

# ENVELOPE COMPONENT METHOD

(Part 2 of 2)

ENV-2-C

PROJECT NAME

DATE

**COOL ROOFS - LOW-SLOPED** - See Section 3.4 in the NRM and §118(i)3 and §143(a)1 in the Energy Standards for further description about exterior roofs and mandatory requirements for Cool Roofs.

☒ **CHECK APPLICABLE BOXES**

☐ **Option 1- Tested - Initial Thermal Emittance  $\geq 0.75$  and Initial Solar Reflectance  $\geq 0.70$**

Proposed emittance and reflectance must be  $\geq$  the standard when tested with CRRC-1.

**Proposed**

**Standard**

1. Enter proposed initial thermal emittance,  $\epsilon_{\text{initial}}$

$\geq 0.75$

If proposed  $\geq$  to the Standard then it complies.

2. Enter the proposed initial solar reflectance,  $\rho_{\text{initial}}$

$\geq 0.70$

If proposed  $\geq$  to the Standard then it complies.

3. When applying **Liquid Field Applied Coatings**, the coating must be applied with a minimum dry mil thickness of 20 mils across the entire roof surface and meet minimum performance requirements listed in §118(i)3 and Table 118-C. Select the applicable coating:

☐ Aluminum-Pigmented Asphalt Roof Coating

☐ Cement-Based Roof Coating

☐ Other \_\_\_\_\_

☐ **Option 2 - CRRC-1 Tested - Initial Thermal Emittance  $< 0.75$**

Proposed initial thermal emittance  $< 0.75$  when tested with CRRC-1.

**Proposed**

**Standard**

1. Enter proposed initial thermal emittance,  $\epsilon_{\text{initial}}$

$< 0.75$

Go to line 2. Insert  $\epsilon_{\text{initial}}$  value in calculation.

2. Enter the initial solar reflectance,  $\rho_{\text{initial}}$

$0.70 + [0.34 \times (0.75 - \epsilon_{\text{initial}})]$

**Standard**  
 $\rho_{\text{initial}} =$

3. To apply **Liquid Field Applied Coatings**, the coating must be applied with a minimum dry mil thickness of 20 mils across the entire roof surface and meet minimum performance requirements listed in §118(i)3 and Table 118-C. Select the applicable coating:

☐ Aluminum-Pigmented Asphalt Roof Coating

☐ Cement-Based Roof Coating

☐ Other \_\_\_\_\_

☒ **CRRC-1 Label Attached to Submittal**

(Note if no CRRC-1 label is available, this compliance method can not be used).

## OPAQUE SURFACES

ASSEMBLY NAME (e.g. Roof-1, Wall-1, Floor-, Soffits, etc...)	TYPE (e.g. Roof, Wall, Floor, demising, etc...)	HEAT CAPACITY	INSULATION R-VALUE*		ASSEMBLY U-FACTOR*		
			PROPOSED	MINIMUM ALLOWED	PROPOSED	Joint Appendix IV REF	MAXIMUM ALLOWED

\* For each assembly type, meet the minimum insulation R-value or the maximum assembly U-factor.

## WINDOWS

	ORIENTATION				Fenestration									
WINDOW NAME	✓	✓	✓	✓	U-FACTOR		# OF	Fen.	PROPOSED RSHG				PROP.	ALLOWED
(e.g., Window-1, Window-2)	N	E	S	W	PROP.	ALLOW.	PANES	SHGC*	H	V	H/V	OHF	RSHG	RSHG
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>										
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>										
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>										
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>										
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>										

\* From Fenestration Surfaces ENV-1-C, Part 2, Column G, or when Column H has a "C" identifier, calculate using the center of glass value SHGC<sub>C</sub> in SHGC<sub>FEN</sub> = .08 + (.86 x SHGC<sub>C</sub>) and enter value.

# OVERALL ENVELOPE METHOD

(Part 1 of 7)

ENV-3-C

PROJECT NAME

DATE

## WINDOW AREA CALCULATION

A. DISPLAY PERIMETER	<input type="text"/>	FT × 6 FT =	<input type="text"/> SF	DISPLAY AREA
B. GROSS EXTERIOR WALL AREA	<input type="text"/>	SF × 0.40 =	<input type="text"/> SF	40% of GROSS EXTERIOR WALL AREA
C. ENTER LARGER OF A OR B			<input type="text"/> SF	MAXIMUM STANDARD AREA
D. ENTER PROPOSED WINDOW AREA			<input type="text"/> SF	PROPOSED AREA
E. WINDOW WALL RATIO = Proposed Window Area Divided by Gross Exterior Wall Area =				<input type="text"/>
F. WEST DISPLAY PERIMETER	<input type="text"/>	FT × 6 FT =	<input type="text"/> SF	WEST DISPLAY AREA
G. WEST EXTERIOR WALL AREA	<input type="text"/>	SF × 0.40 =	<input type="text"/> SF	40% of WEST EXTERIOR WALL AREA
H. ENTER THE LARGER OF F AND G			<input type="text"/> SF	MAXIMUM STANDARD WEST AREA
I. ENTER PROPOSED WEST WINDOW AREA			<input type="text"/> SF	PROPOSED WEST WINDOW AREA
J. WEST WINDOW WALL RATIO = Proposed West Window Area Divided by West Exterior Wall Area =				<input type="text"/>

## Combined Values for North, East and South Walls

K. N/E/S DISPLAY PERIMETER (A - F)	<input type="text"/>	FT × 6 FT =	<input type="text"/> SF	N/E/S DISPLAY AREA
L. N/E/S EXTERIOR WALL AREA (B - G)	<input type="text"/>	SF × 0.40 =	<input type="text"/> SF	40% N/E/S AREA
M. ENTER LARGER OF K OR L			<input type="text"/> SF	MAXIMUM STANDARD N/E/S AREA
N. PROPOSED N/E/S WINDOW AREA (A - I)			<input type="text"/> SF	PROPOSED N/E/S AREA

## Window adjustment

O. IF D>C and/or if I>H, PROCEED TO THE CALCULATION STEPS 1 OR 2 BELOW, AS APPROPRIATE, FOR WINDOW AREA ADJUSTMENT. IF NOT, GO TO THE SKYLIGHT AREA TEST ON PAGE

1. IF I<H: Use the calculated Window Adjustment Factor (WAF) for all walls.

MAX. STANDARD AREA (from C)		PROPOSED WINDOW AREA (from D)		WINDOW ADJUSTMENT FACTOR
<input type="text"/>	÷	<input type="text"/>	=	<input type="text"/>

GO TO PART 6 TO CALCULATE ADJUSTED AREA

2. IF I>H: Calculate one Window Adjustment Factor (WAF) for the West wall, and a second WAF for all other orientations.

a. Calculate the WAF for the West wall.

MAX. STANDARD WEST AREA (from H)		PROPOSED WEST AREA (from I)		WEST WINDOW ADJUSTMENT FACTOR
<input type="text"/>	÷	<input type="text"/>	=	<input type="text"/>

b. Calculate the WAF for the North, East and South walls.

MAX. STANDARD N/E/S AREA (from M)		PROPOSED N/E/S AREA (from N)		N/E/S WINDOW ADJUSTMENT FACTOR
<input type="text"/>	÷	<input type="text"/>	=	<input type="text"/>

GO TO PART 6 TO CALCULATE ADJUSTED AREA



# OVERALL ENVELOPE METHOD

(Part 2 of 7)

ENV-3-C

PROJECT NAME

DATE

## SKYLIGHT AREA CALCULATION

A. ATRIUM or SKYLIGHT HEIGHT

FT

GROSS ROOF  
AREA

STANDARD  
ALLOWED  
SKYLIGHT AREA

B. IF Height in A  $\leq$  55 FT

SF  $\times$  0.05 =

SF

C. IF Height in A  $>$  55 FT

SF  $\times$  0.10 =

SF

D. PROPOSED SKYLIGHT AREA

SF

IF THE PROPOSED SKYLIGHT AREA IS GREATER THAN THE STANDARD SKYLIGHT AREA PROCEED TO THE NEXT CALCULATION FOR THE SKYLIGHT AREA ADJUSTMENT. IF NOT GO TO PART 3 OF 7.

1. IF PROPOSED SKYLIGHT AREA  $\geq$  STANDARD SKYLIGHT AREA:

STANDARD  
SKYLIGHT AREA

PROPOSED SKYLIGHT  
AREA (IF E = 0 ENTER 1)

SKYLIGHT  
ADJUSTMENT FACTOR

$\div$

=

GO TO PART 3, 4, 6 TO CALCULATE ADJUSTED AREAS

**ENV-3-C**

DATE \_\_\_\_\_

TOTAL

# OVERALL ENVELOPE METHOD

(Part 4 of 7)

ENV-3-C

PROJECT NAME

DATE

## OVERALL HEAT GAIN FROM CONDUCTION

	A		B	C	D	E		F	G	H	I	J	
	PROPOSED							STANDARD					
	ASSEMBLY NAME (e.g. Wall-1, Floor-1)			AREA	TEMP FACTOR	HEAT CAPACITY	U - FACTOR <sup>1</sup>	Joint App. IV REF.	HEAT GAIN (B x C x E)	AREA <sup>2</sup> (Adjusted)	U - FACTOR	TEMP FACTOR	HEAT GAIN (G x H x I)
WALLS													
ROOFS/CEILINGS													
FLOORS/SOFFITS													
WINDOWS						N/A							
						N/A							
						N/A							
						N/A							
SKYLIGHTS						N/A							
						N/A							
						N/A							
						N/A							
						N/A							
						N/A							
					N/A								

<sup>1</sup> In climate zones 1 and 16 the insulating R-value of continuous insulation materials installed above the roof waterproof membrane must be multiplied by 0.8 before choosing the table column for determining assembly U-factor. See footnotes for Tables IV.1 through IV.7 in the Joint Appendices.

<sup>2</sup> If Window and/or Skylight Area Adjustment is required, use adjusted areas from Part 7 of 7.

SUBTOTAL

Subtotals are entered under  
"Subtotal" in COLUMNS I and M  
of  
ENV-3-C, Part 6 of 7.

SUBTOTAL

# ENV-3-C

DATE \_\_\_\_\_

Enter calculated value in Column F below.

Enter calculated value in Column F below.

Enter default value in Column F below.

Enter standard value in Column F below.

SUBTOTAL

# OVERALL ENVELOPE METHOD

(Part 6 of 7)

ENV-3-C

PROJECT NAME

DATE

## OVERALL HEAT GAIN FROM RADIATION

## FENESTRATION SURFACES

	A	B	C	D	E	F	G	H	I	J	K	L	M
			PROPOSED							STANDARD			
	WINDOW/SKYLIGHT NAME	WEIGHTING		SOLAR FACTOR		OVERHANG			HEAT GAIN <sup>2</sup> (BxCx)	AREA	RSHG or	SOLAR FACTOR	HEAT GAIN
	(e.g Window-1, Sky-1)	FACTOR	AREA		SHGC <sup>1</sup>	H	V	H/V	OHF	DxExH)	(Adjusted) <sup>3</sup>	SHGC <sup>4</sup>	(BxJxK xL)
NORTH													
EAST													
SOUTH													
WEST													
SKYLIGHTS						N/A	N/A	N/A	N/A				
						N/A	N/A	N/A	N/A				
						N/A	N/A	N/A	N/A				
						N/A	N/A	N/A	N/A				
						N/A	N/A	N/A	N/A				
					Part 4 Subtotal					Part 4 Subtotal			
					Part 5 Subtotal					Part 5 Subtotal			
					Part 6 Subtotal					Part 6 Subtotal			
					TOTAL					TOTAL			

<sup>1</sup> From Fenestration Surfaces ENV-1-C, Part 2, column G, or when Column H has a "C" identifier, calculate using the center of glass value SHGC<sub>c</sub> in SHGC<sub>fen</sub> = .08 + (0.86XSHGC<sub>c</sub>) and enter value.

<sup>2</sup> Proposed Heat Gain, Column I may be no greater than Standard Heat Gain Column M.

<sup>3</sup> If Window and/or Skylight Area Adjustment is required, use adjusted areas from Part 7 of 7.

<sup>4</sup> Only SHGC is used for Skylights

# OVERALL ENVELOPE METHOD

(Part 7 of 7)

ENV-3-C

PROJECT NAME

DATE

## WINDOW AREA ADJUSTMENT CALCULATIONS

Note: Putting the letters at the top of the columns in boxes is completely inconsistent with all the other pages

☒ CHECK IF NOT APPLICABLE (see Part 1 of 7)

A					B	C	D	E	F	G
WALL NAME (e.g. Wall-1, Wall-2)	ORIENTATION				GROSS AREA	DOOR AREA	WINDOW AREA	WINDOW ADJUSTMENT FACTOR (From Part 1)	ADJUSTED WINDOW AREA (D×E)	ADJUSTED WALL AREA B-(F+C)
	N	E	S	W						
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						

TOTALS:

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## SKYLIGHT AREA ADJUSTMENT CALCULATIONS

☒ CHECK IF NOT APPLICABLE (see Part 2 of 7)

A	B	C	D	E	F
ROOF NAME (e.g. Roof-1, Roof-2)	GROSS AREA	SKYLIGHT AREA	SKYLIGHT ADJUSTMENT FACTOR (From Part 1)	ADJUSTED SKYLIGHT AREA (C×D)	ADJUSTED ROOF AREA (B - E)

TOTALS:

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## Skylight Area Support Worksheet - *Minimum Fraction of Daylit Area Method*

### SKYLIGHT AREA FOR LARGE ENCLOSED SPACES

☒ This worksheet applies to buildings with an enclosed space > 25,000ft<sup>2</sup> with a ceiling height > 15 ft and an LPD for the space for general lighting  $\geq 0.5$  W/ft<sup>2</sup>.

Name or designation of large enclosed space on plans \_\_\_\_\_

A. Enter proposed daylit area as indicated on plans

Proposed Daylit Area

Proposed daylit area is indicated on page \_\_\_\_\_ of the plans

B. Floor Area:

x 0.50 =

Minimum Daylit Area

☒ **Criterion 1: Proposed Daylit Area is equal to or greater than Minimum Daylit Area**

C. Select the appropriate box based on the LPD in W/ft<sup>2</sup>:

☐ LPD>1.4

☐ 1.0<LPD<1.4

☐ 0.5< LPD<1.0

Enter 3.6% →

Enter 3.3% →

Enter 3.0% →

Skylight-Daylit Fraction

D. Minimum skylight area: Enter the product B x C then divide by 100

Minimum Skylight Area

E. Enter the proposed total skylight area in the large enclosed space

Proposed Skylight area

☒ **Criterion 2: Proposed skylight area is equal to or greater than minimum skylight area**

☒ **Criterion 3: Haze rating of skylight glazing or skylight diffuser is greater than 90%.**

Document and page number with haze specification of skylights \_\_\_\_\_

☒ **Large enclosed space complies with Criteria 1, 2, and 3 above [Sections 143(c) 1, 2, and-3].**

## Skylight Area Support Worksheet - Minimum Effective Aperture Method

This worksheet applies to buildings with an enclosed space > 25,000ft<sup>2</sup> with a ceiling height > 15ft and an LPD for the space for general lighting ≥ 0.5 W/ft<sup>2</sup>.

Name or designation of large enclosed space on plans \_\_\_\_\_

F. Enter proposed daylit area as indicated on plans

SF

Proposed Daylit Area

Proposed daylit area is indicated on page \_\_\_\_\_ of the plans

G. Floor Area:

SF

x 0.50 =

SF

Minimum Daylit Area

☒ **Criterion 1: Proposed Daylit Area is equal to or greater than Minimum Daylit Area**

H. Select the appropriate box for LPD:

☐ LPD>1.4

☐ 1.0<LPD<1.4

☐ 0.5<LPD<1.0

Enter 1.2% →

Enter 1.1% →

Enter 1.0% →

Min Effective Aperture

I. Skylight Visible Light Transmittance (VLT<sub>s</sub>) VLT<sub>s</sub> is from manufacturers specifications.

VLT<sub>s</sub>

J. Well Cavity Ratio. Select one of the well types, fill in columns A, B, and C and calculate the WCR with the appropriate equation below.

	A	B	C	
	Well Height	Well Length	Well Width	
Rectangular Wells:	<input type="checkbox"/>		note	
	$WCR = \left( \frac{5 \times \text{well height} (\text{well length} + \text{well width})}{\text{well length} \times \text{well width}} \right)$			WCR
	Well Height	Well Perimeter	Well Area	

Non-Rectangular Wells:	<input type="checkbox"/>			
	$WCR = \left( \frac{2.5 \times \text{well height} \times \text{well perimeter}}{\text{well area}} \right)$			WCR

K. Average Well Wall Reflectance (%), ρ

Wall ρ

L. Well Efficiency (from equation in Section 5.6 of the Nonresidential Manual or from nomograph, Figure 146-A)

Well Efficiency

M. Calculate Minimum Skylight Area:

$A_s = \text{Effective Aperture (H)} \times \text{Daylit Area (F)}$

$0.85 \times VLT(I) \times \text{WellEfficiency}(L)$

Minimum Skylight Area

N. Enter the Proposed Skylight Area.

Proposed Skylight Area

☒ **Criterion 2: Proposed skylight area is equal to or greater than minimum skylight area**

☒ **Criterion 3: Haze rating of skylight glazing or skylight diffuser is greater than 90%.**

Document and page number with haze specification of skylights \_\_\_\_\_

☒ **Large enclosed space complies with Criteria 1, 2, and 3 above [Sections 143(c) 1, 2, and-3].**



<b>CEC DEFAULT U-FACTOR AND SHGC LABEL CERTIFICATE FORM</b>				<b>FC-1</b>
<b>PROJECT INFORMATION</b>				
PROJECT NAME:			DATE:	
PROJECT ADDRESS:				
<b>CEC DEFAULT U-FACTOR AND SHGC LABEL CERTIFICATE</b> (Use only for Site-Built Fenestration Product Lines)		U-factors and SHGC are derived from the California Energy Commission Fenestration Default U-factors and SHGC Default Table based on data reported below.  <div style="text-align: center; font-size: 1.2em;"> <b>U-factor = _____</b>  <b>SHGC = _____</b> </div> This Fenestration Product Line meets the air infiltration requirements of Section 116(a) 1, 2005 California Energy Efficiency Standards for Residential and Nonresidential Buildings.		
<b>PRODUCT LINE INFORMATION</b> (Complete a separate Default Label Certificate for each fenestration product line)				
Total Number of units for this product line:		Total square footage of this product line:		
Elevation drawing page:		Fenestration (window & door) schedule page:		
Location(s) on building: S, N, E, W (Enter appropriate orientation(s))		Total Fenestration Area (ft <sup>2</sup> ) on project:		
<input checked="" type="checkbox"/> <b>Method 1 - DEFAULT FENESTRATION U-FACTOR AND SHGC FROM STANDARD TABLES 116-A AND 116-B of the 2005 California Energy Efficiency Standards for Residential and Nonresidential Buildings.</b>				
Frame Type		<input type="checkbox"/> Metal <input type="checkbox"/> Metal Thermal Break (or Structural Glazing) <input type="checkbox"/> Nonmetal		
U-factor Table 116-A Product Type		<input type="checkbox"/> Operable <input type="checkbox"/> Fixed <input type="checkbox"/> Greenhouse, Garden Window <input type="checkbox"/> Door <input type="checkbox"/> Skylight		
Glazing Type		<input type="checkbox"/> Single Pane <input type="checkbox"/> Double Pane      Default U-factor =		Calculate <b>U-factor adjustment</b> . See <b>U-factor Adjustment</b> below.
SHGC Table 116-B Product Type		<input type="checkbox"/> Operable <input type="checkbox"/> Fixed		
SHGC Table 116-B Glazing Tint		<input type="checkbox"/> Clear <input type="checkbox"/> Tint      Default SHGC =		(Insert default value here and in above gray box next to SHGC)
<b>U-Factor Adjustment (See Table 116-A, Footnote 1 and 2)</b>				
<input type="checkbox"/> Nonmetal-framed manufactured fenestration products with metal cladding must add 0.04 to the listed U-factor. <input type="checkbox"/> Subtract 0.05 for spacers of 7/16 inch or wider <input type="checkbox"/> Subtract 0.05 for products certified by the manufacturer as low-E glazing. <input type="checkbox"/> Add 0.05 for products with dividers between panes if spacer is less than 7/16 inch wide. <input type="checkbox"/> Add 0.05 for products with true divided lite (dividers through the panes).				
U-Factor Adjustment =		(If applicable insert adjustment result in above gray box next to U-factor)		
<b>PERSON TAKING RESPONSIBILITY FOR FENESTRATION COMPLIANCE CONTACT PERSON:</b>				
Contact Person:				
Company name and address:				
Phone:		Fax:		Signature:

<b>CEC ALTERNATIVE DEFAULT U-FACTOR AND SHGC LABEL CERTIFICATE</b>				<b>FC-2</b>
<b>PROJECT INFORMATION</b>				
PROJECT NAME:			DATE:	
PROJECT ADDRESS:				
<b>CEC ALTERNATIVE DEFAULT U-FACTOR AND SHGC LABEL CERTIFICATE</b>  (Use only for Site-Built Fenestration Product Lines)		U-factors and SHGC are derived from the California Energy Commission Fenestration Default U-factors and SHGC Default Table based on data reported below.  <div style="text-align: center; font-size: 1.2em;"> <b>U-factor = ____</b>  <b>SHGC = ____</b> </div> This Fenestration Product Line meets the air infiltration requirements of Section 116(a) 1, 2005 <i>California Energy Efficiency Standards for Residential and Nonresidential Buildings</i> .		
Method 2 - Alternative Default Certificate shall not be used for site-built fenestration in buildings with 10,000ft <sup>2</sup> or more of site-built fenestration area.				
<b>PRODUCT LINE INFORMATION</b> (Complete a separate Default Label Certificate for each fenestration product line)				
Total Number of units for this product line:		Total square footage of this product line:		
Elevation drawing page:		Fenestration (window & door) schedule page:		
Location(s) on building: S, N, E, W (Enter appropriate orientation(s))		Total Fenestration Area (ft <sup>2</sup> ) on project:		
<input checked="" type="checkbox"/> <input type="checkbox"/> Method 2 DEFAULT FENESTRATION U-FACTOR FROM ACM APPENDIX NI-2005 Table NI-1 and MANUFACTURER'S DOCUMENTATION FOR SHGCc.				
Product Type Systems <input type="checkbox"/> Glazed Wall <input type="checkbox"/> Skylight with Curb <input type="checkbox"/> Skylight without Curb				
Frame Type <input type="checkbox"/> Aluminum <input type="checkbox"/> Aluminum Metal Thermal Break <input type="checkbox"/> Wood/Vinyl <input type="checkbox"/> Reinforced Vinyl/Aluminum Clad Wood <input type="checkbox"/> Structural Glazing				
Glazing Type and thickness <input type="checkbox"/> Single 1/8" Glass <input type="checkbox"/> Single 1/8" Acrylic/polycarb <input type="checkbox"/> Single 1/4" Acrylic/polycarb <input type="checkbox"/> Double Glazing <input type="checkbox"/> Triple- Glazing <input type="checkbox"/> Quadruple-Glazing				
Coating Emissivity <input type="checkbox"/> 0.05 <input type="checkbox"/> 0.10 <input type="checkbox"/> 0.20 <input type="checkbox"/> 0.40 <input type="checkbox"/> 0.60				
Coated Surfaces <input type="checkbox"/> 2 or 3 <input type="checkbox"/> 2, 3, 4, or 5 <input type="checkbox"/> 2 or 3 and 4 or 5				
Glazing Spacing <input type="checkbox"/> 1/4" Airspace <input type="checkbox"/> 1/2" Airspace				
Gas Fill Between Panes <input type="checkbox"/> Air <input type="checkbox"/> Argon <input type="checkbox"/> Krypton				
<b>CEC ALTERNATIVE DEFAULT FENESTRATION U-FACTOR =</b>		From Assembly U-Factors – ACM Appendix NI-2005 Table NI-1 (Insert value in above gray box next to U-factor)		
<b>DEFAULT SOLAR HEAT GAIN COEFFICIENT</b>				
SHGC for Center of Glass		<b>SHGCc =</b> _____ From Manufacturer's Documentation (Insert value " <b>SHGCc</b> " in equation below)		
Calculate SHGC Fenestration Equation from 2005 Appendix NI-2005 (NI.1 Solar Heat Gain Coefficient)		$SHGC_{fen} = 0.08 + (0.86 \times SHGCc) =$ (Insert calculated result value in above gray box next to SHGC)		
<b>ATTACHED MANUFACTURED DOCUMENTATION</b>				
Manufacturer's documentation must be attached showing the Product Type, Frame Type, Glazing Type, and SHGCc information needed to determine the Default U-factor and SHGC from the Applicable Table or equation.				
<b>PERSON TAKING RESPONSIBILITY FOR FENESTRATION COMPLIANCE CONTACT PERSON:</b>				
Contact Person:				
Company name and address:				
Phone:		Fax:		Signature:

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# Mechanical Forms - Compliance

# **CERTIFICATE OF COMPLIANCE      (Part 1 of 3)      MECH-1-C**

PROJECT NAME		DATE
PROJECT ADDRESS		<div style="border-top: 1px solid black; margin-bottom: 5px;">Building Permit</div> <div style="border-top: 1px solid black; margin-bottom: 5px;">Checked by/Date</div> <div style="border-top: 1px solid black;">Enforcement Agency Use</div>
PRINCIPAL DESIGNER-MECHANICAL	TELEPHONE	
DOCUMENTATION AUTHOR	TELEPHONE	

## GENERAL INFORMATION

DATE OF PLANS	BUILDING CONDITIONED FLOOR AREA	CLIMATE ZONE
<b>BUILDING TYPE</b> <input type="checkbox"/> NONRESIDENTIAL <input type="checkbox"/> HIGH RISE RESIDENTIAL <input type="checkbox"/> HOTEL/MOTEL GUEST ROOM		
<b>PHASE OF CONSTRUCTION</b> <input type="checkbox"/> NEW CONSTRUCTION <input type="checkbox"/> ADDITION <input type="checkbox"/> ALTERATION <input type="checkbox"/> UNCONDITIONED (file affidavit)		
<b>PROOF OF ENVELOPE COMPLIANCE</b> <input type="checkbox"/> PREVIOUS ENVELOPE PERMIT <input type="checkbox"/> ENVELOPE COMPLIANCE ATTACHED		

## STATEMENT OF COMPLIANCE

This Certificate of Compliance lists the building features and performance specifications needed to comply with Title 24, Parts 1 and 6 of the California Code of Regulations. This certificate applies only to building mechanical requirements.

The documentation preparer hereby certifies that the documentation is accurate and complete.

DOCUMENTATION AUTHOR	SIGNATURE	DATE
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The Principal Mechanical Designer hereby certifies that the proposed building design represented in this set of construction documents is consistent with the other compliance forms and worksheets, with the specifications, and with any other calculations submitted with this permit application. The proposed building has been designed to meet the mechanical requirements contained in the applicable parts of Sections 100, 101, 102, 110 through 115, 120 through 125, 142, 144 and 145.

✓

- ☐ The plans & specifications meet the requirements of Part 6 (Sections 10-103a).
- ☐ The installation certificates meet the requirements of Part 6 (10-103a 3).
- ☐ The operation & maintenance information meets the requirements of Part 6 (10-103c).

**Please check one:** (These sections of the Business and Professions Code are printed in full in the Nonresidential Manual.)

- ☐ I hereby affirm that I am eligible under the provisions of Division 3 of the Business and Professions Code to sign this document as the person responsible for its preparation; and that I am licensed in the State of California as a civil engineer or mechanical engineer, or I am a licensed architect.
- ☐ I affirm that I am eligible under the exemption to Division 3 of the Business and Professions Code by Section 5537.2 or 6737.3 to sign this document as the person responsible for its preparation; and that I am a licensed contractor performing this work.
- ☐ I affirm that I am eligible under the exemption to Division 3 of the Business and Professions Code to sign this document because it pertains to a structure or type of work described pursuant to Business and Professions Code sections 5537, 5538, and 6737.1.

PRINCIPAL MECHANICAL DESIGNER-NAME	SIGNATURE	DATE	LIC. #
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## INSTRUCTIONS TO APPLICANT MECHANICAL COMPLIANCE & WORKSHEETS (check box if worksheet is included)

<input type="checkbox"/> MECH-1-C	Certificate of Compliance. Part 1 of 3, 2 of 3, 3 of 3 are required on plans for all submittals
<input type="checkbox"/> MECH-2-C	Certificate of Compliance. Part 1 of 3, 2 of 3, 3 of 3 are required for all submittals, but may be on plans.
<input type="checkbox"/> MECH-3-C	Certificate of Compliance are required for all submittals with mechanical ventilation, but may be on plans.
<input type="checkbox"/> MECH-4-C	Certificate of Compliance are required for all prescriptive submittals, but may be on plans.

# CERTIFICATE OF COMPLIANCE

(Part 2 of 3)

MECH-1-C

PROJECT NAME

DATE

## Designer:

This form is to be used by the designer and attached to the plans. Listed below are all the acceptance tests for mechanical systems. The designer is required to check the boxes by all acceptance tests that apply and list all equipment that requires an acceptance test. If all equipment of a certain type requires a test, list the equipment description and the number of systems to be tested in parentheses. The NJ number designates the Section in the Appendix of the Nonresidential ACM Manual that describes the test. Also indicate the person responsible for performing the tests (i.e. the installing contractor, design professional or an agent selected by the owner). Since this form will be part of the plans, completion of this section will allow the responsible party to budget for the scope of work appropriately.

## Building Departments:

**Systems Acceptance.** Before occupancy permit is granted for a newly constructed building or space, or a new space-conditioning system serving a building or space is operated for normal use, all control devices serving the building or space shall be certified as meeting the Acceptance Requirements for Code Compliance.

In addition a Certificate of Acceptance, MECH-1-A, Form shall be submitted to the building department that certifies plans, specifications, installation certificates, and operating and maintenance information meet the requirements of §10-103(b) and Title 24 Part 6.

### Test Description

### Test Performed By:

✓ ☐ MECH-2-A: Ventilation System Acceptance Document

- Variable Air Volume Systems Outdoor Air Acceptance
- Constant Air Volume Systems Outdoor Air Acceptance

*Test required on all New systems both New Construction and Retrofit.*

Equipment requiring acceptance testing \_\_\_\_\_

\_\_\_\_\_

✓ ☐ MECH-3-A: Packaged HVAC Systems Acceptance Document

*Test required on all New packaged systems both New Construction and Retrofit.*

Equipment requiring acceptance testing \_\_\_\_\_

\_\_\_\_\_

✓ ☐ MECH-4-A: Air-Side Economizer Acceptance Document

*Test required on all new air-side economizers for both New Construction and Retrofit. Units with economizers that are installed at the factory and certified with the Commission do not require equipment testing but do require construction inspection.*

Equipment requiring acceptance testing \_\_\_\_\_

\_\_\_\_\_

**CERTIFICATE OF COMPLIANCE****(Part 3 of 3)****MECH-1-C**

PROJECT NAME	DATE
<b>Test Description</b>	<b>Test Performed By:</b>
<p>✓ <input type="checkbox"/> MECH-5-A: Air Distribution Acceptance Document <i>This test required If the unit serves 5,000 ft<sup>2</sup> of space or less and 25% or more of the ducts are in nonconditioned or semiconditioned space like an attic. <u>New</u> systems that meet the above requirements. <u>Retrofit</u> systems that meet the above requirements and either extend ducts, replace ducts or replace the packaged unit.</i></p> <p>Equipment requiring acceptance testing _____</p> <p>_____</p>	
<p>✓ <input type="checkbox"/> MECH-6-A : Demand Control Ventilation Acceptance Document <i>All new DCV controls installed on new or existing packaged systems must be tested.</i></p> <p>Equipment requiring acceptance testing _____</p> <p>_____</p>	
<p>✓ <input type="checkbox"/> MECH-7-A: Supply Fan Variable Flow Control Acceptance Document <i>All new VAV fan volume controls installed on new or existing systems must be tested.</i></p> <p>Equipment requiring acceptance testing _____</p> <p>_____</p>	
<p>✓ <input type="checkbox"/> MECH-8-A: •Hydronic System Control Acceptance Document</p> <ul style="list-style-type: none"><li>• Variable Flow Controls, <i>Applies to chilled and hot water systems.</i></li><li>• Automatic Isolation Controls, <i>Applies to new boilers and chillers and the primary pumps are connected to a common header.</i></li><li>• Supply Water Temperature Reset Controls, <i>Applies to new constant flow chilled and hot water systems that have a design capacity greater than or equal to 500,000 Btu/hr.</i></li><li>• Water-loop Heat Pump Controls, <i>Applies to all new waterloop heat pump systems where the combined loop pumps are greater than 5 hp.</i></li><li>• Variable Frequency Control, <i>Applies to all new distribution pumps on new variable flow chilled, hydronic heat pump or condenser water systems where the pumps motors are greater than 5 hp.</i></li></ul> <p>Equipment requiring acceptance testing _____</p> <p>_____</p>	

# AIR SYSTEM REQUIREMENTS

(Part 1 of 3)

MECH-2-C

PROJECT NAME:

DATE:

ITEM or SYSTEM TAG(S)

AIR SYSTEMS, Central or Single Zone

## MANDATORY MEASURES

T-24  
Section

Reference on Plans or Specification<sup>1</sup>

Heating Equipment Efficiency  
Cooling Equipment Efficiency  
Heat Pump Thermostat  
Furnace Controls  
Natural Ventilation  
Minimum Ventilation  
VAV Minimum Position Control  
Demand Control Ventilation  
Time Control  
Setback and Setup Control  
Outdoor Damper Control  
Isolation Zones  
Pipe Insulation  
Duct Insulation

## PRESCRIPTIVE MEASURES

Calculated Heating Capacity<sup>2</sup>  
Proposed Heating Capacity<sup>2</sup>  
Calculated Cooling Capacity<sup>2</sup>  
Proposed Cooling Capacity<sup>2</sup>  
Fan Control  
DP Sensor Location  
Supply Pressure Reset (DDC only)  
Simultaneous Heat/Cool  
Economizer  
Heat and Cool Air Supply Reset  
Duct Sealing

1: For each central and single zone air systems (or group of similar units) fill in the reference to sheet number and/or specification section and paragraph number where the required features are documented. If a requirement is not applicable, put "N/A" in the column.

2: Not required for hydronic heating or cooling. Either enter value here or put in reference to plans and specifications per footnote 1.





SERVICE HOT WATER & POOL REQUIREMENTS (Part 3 of 3)					MECH-2-C	
PROJECT NAME:			DATE:			
<i>ITEM or SYSTEM TAG(S)</i>		<i>Service Hot Water, Pool Heating</i>				
		<b>T-24 Section</b>	<b>Reference on Plans or Specification<sup>1</sup></b>			
<b>MANDATORY MEASURES</b> Water Heater Certification Water Heater Efficiency Service Water Heating Installation Pool and Spa Efficiency and Control Pool and Spa Installation Pool Heater – No Pilot Light Spa Heater – No Pilot Light		§113 (a)				
		§113 (b)				
		§113 (c)				
		§114 (a)				
		§114 (b)				
		§115 (c)				
		§115 (d)				
1: For each water heater, pool heat and domestic water loop (or groups of similar equipment) fill in the reference to sheet number and/or specification section and paragraph number where the required features are documented. If a requirement is not applicable, put "N/A" in the column.						

MECHANICAL VENTILATION AND REHEAT

MECH-3-C

PROJECT NAME

DATE

MECHANICAL VENTILATION (§121(b)2)										REHEAT LIMITATION (§144(d))			
AREA BASIS					OCCUPANCY BASIS					VAV Minimum			
A	B	C	D	E	F	G	H	I	J	K	L	M	N
Zone/ System	Condition Area (ft²)	CFM per ft²	Min CFM by Area B x C	Num of People	CFM per Person	Min CFM by Occupant E x F	REQ'D V.A. Max of D or G	Design Ventilation Air cfm	30% of Design Zone Supply cfm	B x 0.4 cfm/ft²	Max of Columns H, J, K, or 300 cfm	Design minimum Air setpoint	Transfer Air
					15								
					15								
					15								
					15								
					15								
					15								
					15								
					15								
					15								
					15								
					15								
					15								
					15								
					15								
					15								
					15								
Totals												Column I Total Design Ventilation Air	

C	Minimum ventilation rate per Section §121, Table 121-A.
E	Based on fixed seat or the greater of the expected number of occupants and 50% of the CBC occupant load for egress purposes for spaces without fixed seating.
H	Required Ventilation Air (REQ'D V.A.) is the larger of the ventilation rates calculated on an AREA BASIS or OCCUPANCY BASIS (Column D or G).
I	Must be greater than or equal to H, or use Transfer Air (column N) to make up the difference.
J	Design fan supply cfm (Fan CFM) x 30%; or
K	Condition area (ft²) x 0.4 cfm/ft²; or
L	Maximum of Columns H, J, K, or 300 cfm
M	This must be less than or equal to Column L and greater than or equal to the sum of Columns H plus N.
N	Transfer Air must be provided where the Required Ventilation Air (Column H) is greater than the Design Minimum Air (Column M). Where required, transfer air must be greater than or equal to the difference between the Required Ventilation Air (Column H) and the Design Minimum Air (Column M), Column H minus M.

# HVAC MISC. PRESCRIPTIVE REQUIREMENTS: MECH-4-C

PROJECT NAME	DATE
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## FAN POWER CONSUMPTION §144(c)

**NOTE:** Provide one copy of this worksheet for each fan system with a total fan system horsepower greater than 25 hp for Constant Volume Fan Systems or Variable Air Volume (VAV) Systems when using the Prescriptive Approach.

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>
FAN DESCRIPTION	DESIGN BRAKE HP	EFFICIENCY		NUMBER OF FANS	PEAK WATTS B x E x 746 / (C x D)	
		MOTOR	DRIVE			

  

<p>FILTER PRESSURE ADJUSTMENT Equation. 144-A</p> <p>A) If filter pressure drop is greater than 1 inch W. C. enter filter pressure drop. <math>SP_a</math> on line 4 and Total Fan pressure <math>SP_f</math> on Line 5.</p> <p>B) Calculate Fan Adjustment and enter on line 6.</p> <p>C) Calculate Adjusted Fan Power Index and enter on Row 7</p>	<p>1) TOTAL FAN SYSTEM POWER (WATTS, SUM COLUMN F)</p> <p>2) SUPPLY DESIGN AIRFLOW (CFM)</p> <p>3) TOTAL FAN SYSTEM POWER INDEX (Row 1 / Row 2)<sup>1</sup></p> <p>4) <math>SP_a</math></p> <p>5) <math>SP_f</math></p> <p>6) Fan Adjustment = <math>1 - (SP_a - 1) / SP_f</math></p> <p>7) ADJUSTED FAN POWER INDEX (Line 3 x Line 6)<sup>1</sup></p>	<p> </p> <p> </p> <p style="text-align: right;">W/CFM</p> <p> </p> <p> </p> <p style="text-align: right;">W/CFM</p>
--	--	---

1. TOTAL FAN SYSTEM POWER INDEX or ADJUSTED FAN POWER INDEX must not exceed 0.8 w/cfm, for Constant Volume systems or 1.25 w/cfm for VAV systems

<b>ITEM or SYSTEM TAG(S)</b>				
<b>PRESCRIPTIVE MEASURES</b>	<b>T-24 Section</b>	<b>Capacity</b>	<b>Exception</b>	<b>Notes</b>
	§144 (g)			
	§144 (h)			
	§144 (i)			

1. Total installed capacity (MBtu/hr) of all electric heat on this project exclusive of electric auxiliary heat for heat pumps. If electric heat is used explain which exception(s) to §144(g) apply.
2. Are centrifugal fan cooling towers used on this project? (Enter "Yes" or "No") If centrifugal fan cooling towers are used explain which exception(s) to §144(h) apply.
3. Total installed capacity (tons) of all chillers and air cooled chillers under this permit, If there are more than 100 tons of air-cooled chiller capacity being installed explain which exception(s) to §144(i) apply.

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# Indoor Lighting Forms - Compliance

# CERTIFICATE OF COMPLIANCE

(Part 1 of 4)

LTG-1-C

PROJECT NAME		DATE
PROJECT ADDRESS		Building Permit  Checked by/Date Enforcement Agency Use
PRINCIPAL DESIGNER-LIGHTING	TELEPHONE	
DOCUMENTATION AUTHOR <b>METHOD OF COMPLIANCE</b>	TELEPHONE	

## GENERAL INFORMATION

DATE OF PLANS	BUILDING CONDITIONED FLOOR AREA	CLIMATE ZONE
<b>BUILDING TYPE</b>	<input type="checkbox"/> NONRESIDENTIAL <input type="checkbox"/> HIGH RISE RESIDENTIAL	<input type="checkbox"/> HOTEL/MOTEL GUEST
<input type="checkbox"/> CONDITIONED SPACES	<input type="checkbox"/> UNCONDITIONED SPACES <input type="checkbox"/> INDOOR / OUTDOOR SIGNS	
<b>PHASE OF CONSTRUCTION</b>	<input type="checkbox"/> NEW <input type="checkbox"/> ADDITION <input type="checkbox"/> ALTERATION	

## METHOD OF COMPLIANCE

<input type="checkbox"/> PERFORMANCE	<input type="checkbox"/> COMPLETE BUILDING	<input type="checkbox"/> AREA CATEGORY	<input type="checkbox"/> TAILORED	<input type="checkbox"/> COMMON LIGHTING
--------------------------------------	--	--	-----------------------------------	--

## STATEMENT OF COMPLIANCE

This Certificate of Compliance lists the building features and performance specifications need to comply with Title 24, Parts 1 and 6 of the California Code of Regulations. This certificate applies only to building lighting requirements.

The documentation preparer hereby certifies that the documentation is accurate and complete.

DOCUMENTATION AUTHOR	SIGNATURE	DATE
----------------------	-----------	------

The Principal Lighting Designer hereby certifies that the proposed building design represented in this set of construction documents is consistent with the other compliance forms and worksheets, with the specifications, and with any other calculations submitted with this permit application. The proposed building has been designed to meet lighting requirements contained in applicable parts of Sections 110, 119, 130-132, 146, 148, & 149 of Title 24, Part 6.

- ☐ The plans & specifications meet the requirements of Part 6 (Sections 10-103a). ☐ The installation certificates meet the requirements of Part 6 (10-103a 3).
- ☐ The operation & maintenance information meet the requirements of Part 6 (10-103c).  
Please check one: (These sections of the Business and Professions Code are printed in full in the Nonresidential Manual.)
- ☐ I hereby affirm that I am eligible under the provisions of Division 3 of the Business and Professions Code to sign this document as the person responsible for its preparation; and that I am licensed in the State of California as a civil engineer or electrical engineer, or I am a licensed architect.
- ☐ I affirm that I am eligible under the provisions of Division 3 of the Business and Professions Code by section 5537.2 or 6737.3 to sign this document as the person responsible for its preparation; and that I am a licensed contractor performing this work.
- ☐ I affirm that I am eligible under Division 3 of the Business and Professions Code to sign this document because it pertains to a structure or type of work described as exempt pursuant to Business and Professions Code Sections 5537, 5538 and 6737.1.

PRINCIPAL LIGHTING DESIGNER-NAME	SIGNATURE	DATE	LIC. #
----------------------------------	-----------	------	--------

## LIGHTING MANDATORY MEASURES

- ✓ ☐ Indicate location on plans of Note Block for Mandatory Measure \_\_\_\_\_

## LIGHTING COMPLIANCE FORMS & WORKSHEETS (check box if worksheet is included)

<input type="checkbox"/> LTG-1-C, Parts 1 of 4 and 2 of 4	Certificate of Compliance. Part 1 of 4 and 2 of 4 are required for all submittals
<input type="checkbox"/> LTG-1-C, Part 3 of 4	Certificate of Compliance. Part 3 of 4 submittal is required only if Control Credits are claimed
<input type="checkbox"/> LTG-1-C, Part 4 of 4	Certificate of Compliance. Part 4 of 4 submittal is required when lighting controls are installed
<input type="checkbox"/> LTG-2-C	Indoor Lighting Schedule
<input type="checkbox"/> LTG-3-C	Portable Lighting Worksheet
<input type="checkbox"/> LTG-4-C	Lighting Controls Credit Worksheet
<input type="checkbox"/> LTG-5-C	Indoor Lighting Power Allowance
<input type="checkbox"/> LTG-6-C	Tailored Method Worksheet
<input type="checkbox"/> LTG-7-C	Room Cavity Ratio Worksheet
<input type="checkbox"/> LTG-8-C	Common Lighting Systems Method Worksheet
<input type="checkbox"/> LTG-9-C	Line Voltage Track Lighting Worksheet
<input type="checkbox"/> OLTG-4-C	Signs (See OLTG-4-C Sign Worksheet in Chapter 6, Outdoor Lighting and Signs Chapter)

# CERTIFICATE OF COMPLIANCE

(Part 2 of 4) **LTG-1-C**

PROJECT NAME

DATE

## INSTALLED INDOOR LIGHTING POWER FOR CONDITIONED AND UNCONDITIONED SPACES

INSTALLED  
WATTS

INSTALLED LIGHTING, CONDITIONED SPACES (From LTG-2-C)

PORTABLE LIGHTING (From LTG-3-C)

LIGHTING CONTROL CREDIT, CONDITIONED SPACES (From LTG-4-C)

CONDITIONED SPACE ADJUSTED INSTALLED LIGHTING POWER

INSTALLED LIGHTING, UNCONDITIONED SPACES (From LTG-2-C)

LIGHTING CONTROL CREDIT, UNCONDITIONED SPACES (From LTG-4-C)

UNCONDITIONED SPACE ADJUSTED INSTALLED LIGHTING POWER

+
-
=
-
=

### ALLOWED INDOOR LIGHTING POWER FOR CONDITIONED SPACES



☐ COMPLETE BUILDING METHOD (from LTG-5-C)

☐ AREA CATEGORY METHOD (from LTG-5-C)

☐ TAILORED METHOD (from LTG-5-C)

ALLOWED  
WATTS

ALLOWED LIGHTING POWER

--

### ALTERNATE COMPLIANCE



☐ PERFORMANCE METHOD

☐ COMMON LIGHTING SYSTEM (from LTG-8-C)

ALLOWED INDOOR LIGHTING POWER FOR UNCONDITIONED SPACES (From LTG-5-C)

--

Watts

### MANDATORY LIGHTING MEASURES FOR INDOOR LIGHTING AND DAYLIT AREAS

#### MANDATORY INDOOR AND DAYLIGHTING AUTOMATIC CONTROLS

CONTROL LOCATION (Room #, Area #, or Description )	CONTROL IDENTIFICATION	CONTROL TYPE (Auto Time Switch, Dimming, Photosensor, etc.)	SPACE CONTROLLED Lists the location of controlled lights	✓ If Control is for Daylighting	NOTE TO FIELD

**(Part 3 of 4) LTG-1-C**

DATE \_\_\_\_\_

[illegible]

# CERTIFICATE OF COMPLIANCE

(Part 4 of 4) LTG-1-C

PROJECT NAME

DATE

## Designer:

This form is to be used by the designer and attached to the plans. Listed below are all the acceptance tests for lighting systems. The designer is required to check the boxes by all acceptance tests that apply and list all equipment that require an acceptance test. If all equipment of a certain type requires a test, list the equipment description and the number of systems to be tested in parentheses. The NJ number designates the Section in the Appendix of the Nonresidential ACM Manual that describes the test. Also indicate the person responsible for performing the tests (i.e. the installing contractor, design professional or an agent selected by the owner). Since this form will be part of the plans, completion of this section will allow the responsible party to budget for the scope of work appropriately.

## Building Departments:

**Systems Acceptance.** Before an occupancy permit is granted for a newly constructed building or space, or a new space-conditioning system serving a building or space is operated for normal use, all control devices serving the building or space shall be certified as meeting the Acceptance Requirements for Code Compliance. In addition a Certificate of Acceptance, MECH-1-A, Forms shall be submitted to the building department that:

- A. Certifies plans, specifications, installation certificates, and operating and maintenance information meet the requirements of §10-103(b) and Title 24 Part 6.

### Test Description

### Test Performed By:

✓ ☐ LTG-2-A: Lighting Control Acceptance Document

- Occupancy Sensor Acceptance
- Manual Daylight Controls Acceptance
- Automatic Time Switch Control Acceptance

Equipment requiring acceptance testing \_\_\_\_\_

✓ ☐ LTG-3-A: Automatic Daylighting Controls Acceptance Document

Equipment requiring acceptance testing \_\_\_\_\_







# PORTABLE LIGHTING WORKSHEET

LTG-3-C

PROJECT NAME

DATE

**TABLE 1 – PORTABLE LIGHTING NOT SHOWN ON PLANS  
FOR OFFICE AREA > 250 SQUARE FEET**

A	B	C	D
ROOM # OR ZONE ID	DEFAULT	AREA (ft <sup>2</sup> )	TOTAL WATTS (B X C)
	0.2		
	0.2		
	0.2		
	0.2		
	0.2		
	0.2		
	TOTAL		

**TABLE 2 – PORTABLE LIGHTING SHOWN ON PLANS  
FOR OFFICE AREA > 250 SQUARE FEET**

A	B	C	D	E	F	G
ROOM # OR ZONE ID	PORTABLE LIGHTING DESCRIPTION(S) PER TASK AREA	LUMINAIRE(S) WATTS PER TASK AREA	TASK AREA (ft <sup>2</sup> )	NUMBER OF TASK AREAS	TOTAL AREA (ft <sup>2</sup> ) (D X E)	TOTAL WATTS (C X E)
				TOTAL		

**TABLE 3 – PLANS SHOW PORTABLE LIGHTING IS NOT REQUIRED  
FOR OFFICE AREAS > 250 SQUARE FEET**

ROOM # OR ZONE ID	TOTAL AREA (ft <sup>2</sup> )	Designer needs to provide detailed documentation that the lighting level provided by the overhead lighting meets the needs of the space. The details include luminaire types and mounting locations relative to work areas.
TOTAL AREA		

## BUILDING SUMMARY

BUILDING SUMMARY	TOTAL AREA (ft <sup>2</sup> )	TOTAL WATTS
BUILDING TOTAL (SUM OF TABLES 1, 2 ,3)		

Enter in LTG-2-C: Portable Lighting

## CONTROL CREDITS FOR CONDITIONED SPACES

DATE \_\_\_\_\_

1) From Equation 146-A  
2) From Table 146-A

PAGE TOTAL	
BUILDING TOTAL	

Enter in LTG-2-C: Lighting Control Credit

**LIGHTING CONTROLS CREDIT WORKSHEET (Part 2 of 2) LTG-4-C**

CONTROL CREDITS FOR UNCONDITIONED SPACES	
1	...
2	...
3	...
4	...
5	...
6	...
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11	...
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96	...
97	...
98	...
99	...
100	...

PROJECT NAME
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DATE
------

[illegible]

- 1) From Equation 146-A
- 2) From Table 146-A

2) From Table 146-A

PAGE TOTAL	→
BUILDING TOTAL	→

BUILDING TOTAL	
----------------	--

Enter in LTG-2-C: Lighting Control Credit	
---	--

# INDOOR LIGHTING POWER ALLOWANCE

## LTG-5-C

PROJECT NAME

DATE

**ALLOWED LIGHTING POWER (Choose One Method)****COMPLETE BUILDING METHOD– CONDITIONED SPACES**

BUILDING CATEGORY (From § 146 Table 146-B)	WATTS PER (ft <sup>2</sup> )	COMPLETE BLDG. AREA	ALLOWED WATTS

**AREA CATEGORY METHOD – CONDITIONED SPACES**

A	B	C	D
AREA CATEGORY (From § 146 Table 146-C)	WATTS PER (ft <sup>2</sup> )	AREA (ft <sup>2</sup> )	ALLOWED WATTS

TOTALS

AREA

WATTS

**TAILORED METHOD– CONDITIONED SPACES**TOTAL ALLOWED WATTS  
(From LTG-6-C)**UNCONDITIONED SPACES**

A	B	C	D
Complete Building and Area Category Methods CATEGORY (From § 146 Table 146-B & C)	WATTS PER (ft <sup>2</sup> )	AREA (ft <sup>2</sup> )	ALLOWED WATTS

TOTALS

AREA

WATTS

**TAILORED METHOD– UNCONDITIONED SPACES**TOTAL UNCONDITIONED SPACES ALLOWED WATTS  
(From LTG-5-C and LTG-6-C)

**TAILORED METHOD WORKSHEET (Part 1 of 3) LTG-6-C**

DATE \_\_\_\_\_

**TAILORED METHOD SUMMARY-Separate Tailored Method Worksheets Must Be Filled Out For Conditioned And Unconditioned Spaces**

---

--

\_\_\_\_\_

$$+ \quad$$
$$+ \quad$$

$$=$$

WATTS

Ornamental/ Special  
Effects Display

---

--

### TAILORED LPD - Illuminance Categories from Table 146-D

[illegible]

--	--

ft<sup>2</sup>

Page 10

 $1 \text{ ft}^2$ 

--

\_\_\_\_\_

2) From Table 146-D Column 2 or *IESNA Handbook*.

**TAILORED METHOD WORKSHEET (Part 2 of 3) LTG-6-C**DATE

## DISPLAY LIGHTING: WALLS

✓ ☐ Qualifying wall display lighting systems shall be mounted within 6 ft to a wall, See §146(b)3B.

[illegible]

TOTAL LENGTH OF DISPLAY WALLS	ft <sup>2</sup>
-------------------------------	-----------------

TOTAL	
Enter on Line 2, Part 1 of LTG-6-C	WATTS

- 1) From Table 146-E.
- 2) From table 146-D Column 3.
- 3) Qualifying wall display lighting systems shall be mounted within 6 ft to a wall.

## DISPLAY LIGHTING: FLOORS

✓ ☐ Qualifying floor display lighting systems shall be mounted no closer than 6 ft to a wall, See §146(b)3B.

[illegible]

TOTAL AREA FLOOR DISPLAYS	ft <sup>2</sup>
---------------------------	-----------------

TOTAL WATTS	
-------------	--

- 4) From table 146-E.
- 5) From table 146-D Column 4.
- 6) Qualifying floor display lighting systems shall be mounted no closer than 6 ft to a wall.



**LTG-6-C**

DATE

# ROOM CAVITY RATIO WORKSHEET (RCR $\geq 3.5$ ) LTG-7-C

PROJECT NAME		FOR ENFORCEMENT AGENCY USE ONLY	
DOCUMENTATION AUTHOR	DATE	PLAN CHECKED BY	DATE

## RECTANGULAR SPACES

A	B	C	D	E	F
Room Number	Task/Activity Description	Room Length (L) (ft)	Room Width (W) (ft)	Room Cavity Height (H) (ft)	Room Cavity Ratio $5 \times H \times (L+W) / (L \times W)$

## NON-RECTANGULAR SPACES

A	B	C	D	E	F
Room Number	Task/Activity Description	Room Area (A) (ft <sup>2</sup> )	Room Perimeter (P) (ft)	Room Cavity Height (H) (ft)	Room Cavity Ratio $2.5 \times H \times P / A$

**LTG-8-C**

DATE \_\_\_\_\_

The Common Lighting Systems method is only appropriate for Building Types listed in Table 146-B (Area Category Method Lighting Power Density Values) where the lighting power density is 1.0 Watts per square foot or greater.

[illegible]

1) CEC default value from Nonresidential ACM Manual Appendix NB.

# LINE VOLTAGE TRACK LIGHTING WORKSHEET

## LTG-9-C

PROJECT NAME

DATE

☒ **METHOD 1 – VOLT-AMPERE (VA) RATING OF THE BRANCH CIRCUIT(S) OR WATTAGE OF THE CURRENT LIMITERS** - ONLY CURRENT LIMITERS CERTIFIED TO THE COMMISSION CAN BE WITH THIS METHOD

A	B	C	D	E	F	G
Branch Circuit Option		Current Limiter Option				
BRANCH CIRCUIT NAME OR ID	VOLT-AMPERE (VA) RATING OF THE BRANCH CIRCUIT (Fill this column only if branch circuit option is used for compliance)	TRACK EQUIPPED WITH CURRENT LIMITER (CL)? (Columns C thru G may be left blank if the branch circuit option is used for compliance)  ✓ IF YES	IF COLUMN (C) IS YES, LIST CURRENT LIMITER WATTAGE (W)	TRACK LENGTH (FT)	MULTIPLY TRACK LENGTH (E) BY 15 W/LF IF THERE IS CL, OR 45 W/LF IF THERE IS NO CL (W)	TRACK WATTAGE – HIGHER OF COLUMNS (D) OR (F) (W)
		<input type="checkbox"/>				
		<input type="checkbox"/>				
		<input type="checkbox"/>				
		<input type="checkbox"/>				
		<input type="checkbox"/>				
SUB-TOTAL WATTS FOR TRACKS ON BRACH CIRCUIT – USE COLUMN (B) VA IF BRANCH CIRCUIT METHOD IS USED, OR TOTAL OF TRACK WATTS IN COLUMN (G) IF THE CL METHOD IS USED						
		<input type="checkbox"/>				
		<input type="checkbox"/>				
		<input type="checkbox"/>				
		<input type="checkbox"/>				
		<input type="checkbox"/>				
SUB-TOTAL WATTS FOR TRACKS ON BRACH CIRCUIT – USE COLUMN (B) VA IF BRANCH CIRCUIT METHOD IS USED, OR TOTAL OF TRACK WATTS IN COLUMN (G) IF THE CL METHOD IS USED						
		<input type="checkbox"/>				
		<input type="checkbox"/>				
		<input type="checkbox"/>				
		<input type="checkbox"/>				
		<input type="checkbox"/>				
SUB-TOTAL WATTS FOR TRACKS ON BRACH CIRCUIT – USE COLUMN (B) VA IF BRANCH CIRCUIT METHOD IS USED, OR TOTAL OF TRACK WATTS IN COLUMN (G) IF THE CL METHOD IS USED						
<b>TOTAL WATTS – ADD ALL SUBTOTALS</b>						

☒ **METHOD 2 – USE THE HIGHER OF: 45 WATTS / LINEAR FOOT OF TRACK – OR TOTAL RATED WATTAGE OF ALL OF ALL LUMINAIRE**

A	B	C	D	E	F
TRACK # OR NAME	LINEAR FEET OF TRACK	(W/LF)	B x C (W)	TOTAL RATED WATTAGE OF ALL LUMINAIRE	LARGER OF (D or E)
		45			
		45			
		45			
		45			
		45			
		45			
TOTAL					

---

# Outdoor Lighting Forms - Compliance

**CERTIFICATE OF COMPLIANCE****(Part 1 of 2)****OLTG-1-C**

PROJECT NAME		DATE
PROJECT ADDRESS		<div>Building Permit</div> <div>Checked by/Date Enforcement Agency Use</div>
PRINCIPAL DESIGNER-LIGHTING	TELEPHONE	
DOCUMENTATION AUTHOR	TELEPHONE	

**GENERAL INFORMATION**

DATE OF PLANS	OUTDOOR LIGHTING ZONE (✓ One) <input type="checkbox"/> LZ1 <input type="checkbox"/> LZ2 <input type="checkbox"/> LZ3 <input type="checkbox"/> LZ4			
FUNCTION TYPE	<input type="checkbox"/> OUTDOOR LIGHTING	<input type="checkbox"/> OUTDOOR SIGNS	<input type="checkbox"/> INDOOR SIGNS	
PHASE OF CONSTRUCTION	<input type="checkbox"/> NEW CONSTRUCTION	<input type="checkbox"/> ADDITIONS	<input type="checkbox"/> ALTERATIONS	

**STATEMENT OF COMPLIANCE**

This Certificate of Compliance lists outdoor lighting system specifications need to comply with Title 24, Parts 1 and 6 of the California Code of Regulations. This certificate applies only to building lighting requirements.

The documentation preparer hereby certifies that the documentation is accurate and complete.

DOCUMENTATION AUTHOR	SIGNATURE	DATE
----------------------	-----------	------

The Principal Lighting Designer hereby certifies that the proposed outdoor lighting and signs design represented in this set of construction documents is consistent with the other compliance forms and worksheets, with the specifications, and with any other calculations submitted with this permit application. The proposed building has been designed to meet the lighting requirements contained in the applicable parts of Sections 110, 119, 130 through 132, 146, and 149 of Title 24, Part 6. **Please ✓ one:**

- ☐ I hereby affirm that I am eligible under the provisions of Division 3 of the Business and Professions Code to sign this document as the person responsible for its preparation; and that I am licensed in the State of California as a civil engineer or electrical engineer, or I am a licensed architect.
- ☐ I affirm that I am eligible under the provisions of Division 3 of the Business and Professions Code by section 5537.2 or 6737.3 to sign this document as the person responsible for its preparation; and that I am a licensed contractor performing this work.
- ☐ I affirm that I am eligible under the provisions of Division 3 of the Business and Professions Code to sign this document because it pertains to a structure or type of work described as exempt pursuant to Business and Professions Code Sections 5537, 5538 and 6737.1.

(These sections of the Business and Professions Code are printed in full in the Nonresidential Manual.)

PRINCIPAL LIGHTING DESIGNER-NAME	SIGNATURE	DATE	LIC. #
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**INSTRUCTIONS TO APPLICANT OUTDOOR LIGHTING COMPLIANCE & WORKSHEETS (✓ box if worksheet is included)**

For detailed instructions on the use of this and all Energy Efficiency Standards compliance forms, please refer to the Nonresidential Manual published by the California Energy Commission.

<input type="checkbox"/> OLTG-1-C	Certificate of Compliance. Required on plans for all submittals for outdoor lighting. Part 2 of 2 may be incorporated in schedules on the plans.
	Either LTG-1-C or OLTG-1-C may be used for signs as follows: 1. Use LTG-1-C if the project consists solely of indoor signs 2. Use LTG-1-C if the project consists of indoor lighting, and outdoor or indoor signs, but no other outdoor lighting. 3. Use OLTG-1-C if the project consists solely of outdoor signs 4. Use OLTG-1-C if the project consists of outdoor lighting, and indoor or outdoor signs, but no other indoor lighting
<input type="checkbox"/> OLTG-2-C	LIGHTING COMPLIANCE SUMMARY. Applicable Parts required for ALL outdoor lighting allowances (Except for Signs)
<input type="checkbox"/> OLTG-3-C	AREA CALCULATIONS WORKSHEETS. Applicable parts required for all outdoor area calculations.
<input type="checkbox"/> OLTG-4-C	SIGN LIGHTING COMPLIANCE. Required for all internally and externally illuminated signs, for both indoor and outdoor signs.

# CERTIFICATE OF COMPLIANCE

(Part 2 of 2)

OLTG-1-C

PROJECT NAME

## Lighting Schedules on Plans Show that Outdoor Lighting Meets Allowed Lighting Power

✓

☐ Lighting power allowances for general site illumination on OLTG-2-C Part 1 of 4

☐ Not Applicable

☐ Lighting power allowances for local ordinances or for security multipliers on OLTG-2-C Part 2 of 4

☐ Not Applicable

☐ Lighting power allowances for specific applications, other than vehicle service stations with canopies on OLTG-2-C Part 3 of 4

☐ Not Applicable

☐ Lighting power allowances for vehicle service station canopies on OLTG-2-C Part 4 of 4

☐ Not Applicable

☐ Sign lighting compliance on OLTG-4-C

☐ Not Applicable

## Mandatory Measures on Plans Show that Outdoor Lighting Meets Outdoor Lighting Controls and Equipment

Indicate location on plans of Note Block for Mandatory Measure

✓

☐ Installed lighting power has been determined in accordance with § 130(c)1

☐ Not Applicable

☐ All permanently installed luminaires with lamps rated over 100 watts either have a lamp efficacy of at least 60 lumens per watt or are controlled by a motion sensor § 132(a)

☐ Not Applicable

☐ All Luminaires with lamps rated greater than 175 watts in hardscape areas, including parking lots, building entrances, canopies, and all outdoor sales areas meet the Cutoff Requirements of § 132(b)

☐ Not Applicable

☐ All permanently installed outdoor lighting meets the Control Requirements of § 132(c)1

☐ Not Applicable

☐ Building facades, parking lots, garages, canopies, and outdoor sales areas meet the Multi-Level Lighting Requirements of § 132(c)2

☐ Not Applicable

## MANDATORY AUTOMATIC CONTROLS

CONTROL LOCATION	CONTROL IDENTIFICATION	CONTROL TYPE Auto Time Switch/Photosensor, etc	AREA CONTROLLED	NOTE TO FIELD











# ILLUMINATED AREA CALCULATION WORKSHEET (Part 1 of 5) OLTG-3-C

PROJECT NAME

DATE

## Hardscape - Method ( i )

### A. Hardscape for automotive vehicular use, including parking lots, driveways and site roads

A	B Actual Paved Area plus 5' perimeter of adjacent unpaved land. Includes planters and landscaped areas less than 10' wide that are enclosed by hardscape on at least 3 sides	C Areas (ft <sup>2</sup> ) to Subtract from within Illuminated Area				F	G	H
		Areas between poles or luminaires that are greater than 6 mounting height distance (If Applicable)	Overlapping Areas of Another Application or Luminaire	Building Areas	Areas Obstructed By Sign or Other Structure		Sub Total of areas to Subtract (C +D + E + F)	
List Specific Application (Table 147-A)								Illuminated Area (B – G)

### B. Hardscape for pedestrian use, including plazas, sidewalks, walkways and bikeways

A	B Actual Paved Area plus 5' of unpaved land on either side of path of travel. Shall include all contiguous paved area before including adjacent grounds.	C Areas (ft <sup>2</sup> ) to Subtract from within Illuminated Area				F	G	H
		Areas between poles or luminaires that are greater than 6 mounting height distance (If Applicable)	Overlapping Areas of Another Application or Luminaire	Building Areas	Areas Obstructed By Sign or Other Structure		Sub Total of areas to Subtract (C +D + E + F)	
List Specific Application (Table 147-A)								Illuminated Area (B – G)

#### Checklist

- ☐ § 147(c)1 B – Each portion of all illuminated areas has been assigned only one lighting application, and the applications are consistent with the actual use of the areas.
- ☐ § 147(c)1 A - General illumination areas includes only those illuminated areas that are in the bounds of the Application and are within a square pattern around a luminaire that is six times the luminaire mounting height, with the luminaire in the middle of the pattern, less any areas that are within buildings, under canopies, beyond property lines, or obstructed by a signs or other structures.

# ILLUMINATED AREA CALCULATION WORKSHEET (Part 2 of 5) OLTG-3-C

PROJECT NAME

DATE

## A. Hardscape Method ii

Hardscape for driveways, site roads, sidewalks, walkways and bikeways -

A		B
List Specific Application (Table 147-A)		Length of 25' wide path incorporating as much of the paved area as possible.

### Checklist

- ☐ § 147(c)1 B – Each portion of all illuminated areas has been assigned only one lighting application, and the applications are consistent with the actual use of the areas.
- ☐ § 147(c)1 B Method ii – General illumination areas for site roadway, driveway, sidewalk, walkway, or bikeway includes only those illuminated areas that are in the bounds of the Application and includes a 25 foot wide area running along the axis of the path of travel and includes as much of the paved area as possible

## B. Building Entrances without Canopies

A	B	C
Width of Door plus 3 feet	Smaller of 18 feet or distance to the edge of the property line	Area (A x B) (ft <sup>2</sup> )

### Checklist

- ☐ § 147(c)1 B – Each portion of all illuminated areas has been assigned only one lighting application, and the applications are consistent with the actual use of the areas.
- ☐ § 147(c)1 A - General illumination areas includes only those illuminated areas that are in the bounds of the Application and are within a square pattern around a luminaire that is six times the luminaire mounting height, with the luminaire in the middle of the pattern, less any areas that are within buildings, under canopies, beyond property lines, or obstructed by a signs or other structures.

# ILLUMINATED AREA CALCULATION WORKSHEET (Part 3 of 5) OLTG-3-C

PROJECT NAME

DATE

## A. Outdoor Sales Lot Frontage and Sales Lot Area

A	B		C	D	E	F		G	H
Gross Illuminated Area (ft <sup>2</sup> )	If an Outdoor Sales Frontage allotment was used, subtract that area from the Gross Illuminated Area								
	Mounting height of Sales Frontage Luminaires (feet)			(In plan view) from frontage luminaire to front edge of Sales Lot	Sales Lot Frontage Length (feet)	Sales Frontage Area (C – D) x E (ft <sup>2</sup> )		Overlap- ing Areas of Another Application	Sales Lot Area A - F - G
		3 X B							

### Checklist

- ☐ § 147(c)1 B – Each portion of all illuminated areas has been assigned only one lighting application, and the applications are consistent with the actual use of the areas.
- ☐ § 147(c) 2 B - Measured in plan view, only illuminated sections of outdoor sales frontage areas that are immediately adjacent to the principal viewing location and unobstructed viewing length, and are within a 3 mounting heights of the frontage have been used. Luminaires qualifying for this allowance are located in plan view between the principal viewing location and the frontage outdoor sales.

## B. Building Façade Area

A		B	C	D	E	F	G	H
Designated Name and Orientation	Length	Height	Gross Area (B x C)	Areas (ft <sup>2</sup> ) to Subtract from the Gross Illuminated Area Do not double count any areas		Area for which Illumination is Obstructed by Other Objects and Area Not Illuminated	Sub Total (E+F)	Net Area Available for Façade Lighting (D-G)
				Areas covered by signs				

### Checklist

- ☐ § 147(c)1 B – Each portion of all illuminated areas has been assigned only one lighting application, and the applications are consistent with the actual use of the areas.
- ☐ § 147(c) 2 A – Only facades areas that are illuminated without obstruction or interference, by one or more luminaires, have been used.



# ILLUMINATED AREA CALCULATION WORKSHEET (Part 5 of 5) OLTG-3-C

PROJECT NAME

DATE

## A. Drive Up Windows

A	B	C
Width of Window plus 6 feet (LF)	Smaller of 30 feet or distance to the edge of the property line (LF)	Area (A x B) (ft <sup>2</sup> )
<b>Checklist</b>		
<input type="checkbox"/> § 147(c) 1 B – Each portion of all illuminated areas has been assigned only one lighting application, and the applications are consistent with the actual use of the areas.		
<input type="checkbox"/> § 147(c) 2 G – Drive up window area includes only illuminated area that is the product of the width of the window plus six feet, and a distance of up to 30 feet outward from the window (not going beyond property lines).		
Enter each Area in OLTG-2-C (Part 3 of 4) in Column B to calculate allotted watts.		

## B. Guarded Facility

A	B	C	D
Area of Guardhouse Indoor (ft <sup>2</sup> )	Smaller of 80 feet or distance to the edge of the property line (LF)	Entrance Area (B x 25ft) (ft <sup>2</sup> )	Area (A + C) (ft <sup>2</sup> )
<b>Checklist</b>			
<input type="checkbox"/> § 147(c) 1 B – Each portion of all illuminated areas has been assigned only one lighting application, and the applications are consistent with the actual use of the areas.			
<input type="checkbox"/> § 147(c) 2 H – The area of guarded facilities includes illuminated areas that include the guardhouse indoor area plus the product of the entrance width of 25 feet and length of up to 80 feet (not going beyond the property line).			
Enter each Area in OLTG-2-C (Part 3 of 4) in Column B to calculate allotted watts.			





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# Lighting Forms - Acceptance

**2005 CERTIFICATE OF ACCEPTANCE (Part 1 of 2)****LTG-1-A**

PROJECT NAME		DATE
PROJECT ADDRESS		Checked by/Date Enforcement Agency Use
TESTING AUTHORITY	TELEPHONE	

**GENERAL INFORMATION**

DATE OF BLDG. PERMIT	PERMIT #	BLDG. CONDITIONED FLOOR AREA	CLIMATE ZONE
BUILDING TYPE	<input type="checkbox"/> NONRESIDENTIAL	<input type="checkbox"/> HIGH RISE RESIDENTIAL	<input type="checkbox"/> HOTEL/MOTEL GUEST ROOM
PHASE OF CONSTRUCTION	<input type="checkbox"/> NEW CONSTRUCTION	<input type="checkbox"/> ADDITION <input type="checkbox"/> ALTERATION	<input type="checkbox"/> UNCONDITIONED

**STATEMENT OF ACCEPTANCE**

This Certificate of Acceptance summarizes the results of the acceptance tests related to building lighting requirements per Title 24, Part 6. (Sections 119(d), 119(e), 131(d))

Please check one:

- ☐ I hereby affirm that I am eligible under the provisions of Division 3 of the Business and Professions Code to sign this document as the person responsible for it's preparation; and that I am licensed in the State of California as a civil engineer or electrical engineer, or I am a licensed architect.
- ☐ I affirm that I am eligible under the exemption to Division 3 of the Business and Professions Code by Section 5537.2 or 6737.3 to sign this document as the person responsible for its preparation; and that I am a licensed contractor performing this work.
- ☐ I affirm that I am eligible under the exemption to Division 3 of the business and Professions Code to sign this document because it pertains to a structure or type of work described pursuant to Business and Professions Code sections 5537, 5538, and 6737.1.

(These sections of the Business and Professions Code are printed in full in the Nonresidential Manual.)

TESTING AUTHORITY - NAME	SIGNATURE	DATE	LIC.#
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**INSTRUCTIONS TO APPLICANT**

*For Detailed instructions on the use of this and all Energy efficiency Standards acceptance forms, please refer to the Nonresidential Manual published by the California Energy Commission.*

Part 1 of 2 - Statement of Acceptance

Part 2 of 2 - Summary of Acceptance Tests



# 2005 ACCEPTANCE REQUIREMENTS FOR CODE COMPLIANCE

## Lighting Control Acceptance Document

LTG-2-A

Form \_\_ of \_\_

PROJECT NAME		DATE
PROJECT ADDRESS		
TESTING AUTHORITY	TELEPHONE	
LIGHTING CONTROL SYSTEM NAME / DESIGNATION		
		Checked by/Date Enforcement Agency Use

**Intent:** Lights are turned off when not needed per 119(d) & 131(d).

### Construction Inspection

- 1 Instrumentation to perform test includes, but not limited to:
  - a. Light meter
  - b. Hand-held amperage and voltage meter
  - c. Power meter
- 2 Occupancy Sensor Construction Inspection
  - ☐ Occupancy sensor has been located to minimize false signals
  - ☐ Occupancy sensors do not encounter any obstructions that could adversely effect desired performance
  - ☐ Ultrasonic occupancy sensors do not emit audible sound (119a) 5 feet from source
- 3 Manual Daylighting Controls Construction Inspection
  - ☐ If dimming ballasts are specified for light fixtures within the daylit area, make sure they meet all the Standards requirements, including "reduced flicker operation" for manual dimming control systems
- 4 Automatic Time Switch Controls Construction Inspection
  - a. Automatic time switch control is programmed for (check all):
    - ☐ Weekdays
    - ☐ Weekend
    - ☐ Holidays
  - b. Document for the owner automatic time switch programming (check all):
    - ☐ Weekdays settings
    - ☐ Weekend settings
    - ☐ Holidays settings
    - ☐ Set-up settings
    - ☐ Preference program setting
  - ☐ Verify the correct time and date is properly set in the time switch
  - ☐ Verify the battery is installed and energized
  - ☐ Override time limit is no more than 2 hours

**Certification Statement:** I certify that all statements are true on this LTG-2-A form including the PASS/FAIL Evaluation.

I affirm I am eligible to sign this form under the provisions described in the Statement of Acceptance on form LTG-1-A

Name: \_\_\_\_\_

Company: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

:

# 2005 ACCEPTANCE REQUIREMENTS FOR CODE COMPLIANCE

## Lighting Control Acceptance Document

LTG-2-A

Form \_\_ of \_\_

PROJECT NAME

DATE

### A. Select Acceptance Test (Indicate lighting control systems Names/Designations by the applicable tests below)

☐ 1 Occupancy Sensor

☐ 2 Manual Daylighting Controls

☐ 3 Automatic Time Switch Controls

### B. Equipment Testing Requirements

#### Applicable Lighting Control Systems

Check and verify those items applicable to selected system:

1

2

3

#### Occupancy Sensor - Step 1: Simulate an unoccupied condition

a. Lights controlled by occupancy sensors turn off within a maximum of 30 minutes from start of an unoccupied condition per Standard Section 119(d)

Y / N

b. The occupant sensor does not trigger a false "on" from movement in an area adjacent to the controlled space or from HVAC operation

Y / N

c. Signal sensitivity is adequate to achieve desired control

Y / N

#### Step 2: Simulate an occupied condition

a. Status indicator or annunciator operates correctly

Y / N

b. Lights controlled by occupancy sensors turn on when Immediately upon an occupied condition OR (this requirement is mutually exclusive with Step 2.c.)

Y / N

c. Sensor indicates space is "occupied" and lights turn on manually

Y / N

#### Step 3: System returned to initial operating conditions

Y / N

#### Manual Daylighting Controls - Step 1: Manual switching control

a. At least 50% of lighting power in daylit areas is separately controlled from other lights

Y / N

b. The amount of light delivered to the space is uniformly reduced

Y / N

#### Step 2: System returned to initial operating conditions

Y / N

#### Automatic Time Switch Controls - Step 1: Simulate occupied condition

a. All lights can be turned on and off by their respective area control switch

Y / N

b. Verify the switch only operates lighting in the ceiling-height partitioned area in which the switch is located

Y / N

#### Step 2: Simulate unoccupied condition

a. All non-exempt lighting turn off per Section 131(d)1

Y / N

b. Manual override switch allows only the lights in the selected ceiling height partitioned space where the override switch is located, to turn on or remain on until the next scheduled shut off occurs

Y / N

c. All non-exempt lighting turns off

Y / N

#### Step 3: System returned to initial operating conditions

Y / N

**Note: Shaded areas do not apply for particular test procedure**

### C. PASS / FAIL Evaluation (check one):

☐ PASS: All applicable **Construction Inspection** responses are complete and all applicable **Equipment Testing Requirements** responses are positive (Y - yes)

☐ FAIL: Any applicable **Construction Inspection** responses are incomplete OR there is one or more negative (N - no) responses in any applicable **Equipment Testing Requirements** section. Provide explanation below. Use and attach additional pages if necessary.

# 2005 ACCEPTANCE REQUIREMENTS FOR CODE COMPLIANCE

<b>Automatic Daylighting Controls Acceptance Document</b>		<b>LTG-3-A</b>
		Form __ of __
PROJECT NAME		DATE
PROJECT ADDRESS		Checked by/Date Enforcement Agency Use
TESTING AUTHORITY	TELEPHONE	
AUTOMATIC DAYLIGHTING CONTROL NAME / DESIGNATION <b>Intent:</b> Verify operation of daylighting systems meet 119(e)2.		

## Construction Inspection

- 1 Instrumentation to perform test includes, but not limited to:
  - a. Light meter
  - b. Hand-held amperage and voltage meter
  - c. Power meter
- 2 Documentation of all control devices (photocells) have been properly located including:
  - a. Factory-calibrated (proof required)
    - ☐ Factory-calibration certificate attached
  - b. Field-calibrated
    - ☐ Setpoint properly set
    - ☐ Lighting threshold
- 3 Documentation has been provided by the installer for:
  - ☐ Setpoints for each device
  - ☐ Settings for each device
  - ☐ Programming for each device
- 4 Luminaires controlled by automatic daylighting controls are only in daylit areas; and
  - ☐ Separately circuited for daylit areas by windows and daylit areas under skylights

**Certification Statement:** I certify that all statements are true on this LTG-3-A form including the

PASS/FAIL Evaluation. \_\_\_\_\_

I affirm I am eligible to sign this form under the provisions described in the Statement of Acceptance on form LTG-1-A

Name: \_\_\_\_\_

Company: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

:

# 2005 ACCEPTANCE REQUIREMENTS FOR CODE COMPLIANCE

## Automatic Daylighting Controls Acceptance Document

LTG-3-A

Form \_\_ of \_\_

PROJECT NAME

DATE

### A. Control System (check all applicable systems and list lighting control systems Names/Designations)

- ☐ 1 Continuous Dimming Control Systems
- ☐ 2 Stepped Dimming Control Systems
- ☐ 3 Stepped Switching Control Systems

### B. Equipment Testing Requirements

#### Applicable Control System

Check and verify those applicable to specific simulation mode:

1 2 3

#### Step 1: Simulate bright conditions

a.	Measured lighting power at fully dimmed condition	kW =			
b.	Rated lighting power at full light output	kW =			
c.	Lighting power reduced by at least 50% in daylit area by windows and at least 65% in daylit areas under skylights.		Y / N		
d.	Only luminaires in daylit zone are affected by daylight control		Y / N	Y / N	Y / N
e.	Automatic daylight control system reduces the amount of light delivered to the space uniformly		Y / N		
f.	Dimming control system provides reduced flicker operation over the entire operating range per Standards Section 119(e)2.		Y / N		
g.	Lumen measurements in the space, location of measurements and specific device settings, program setting and other measurements are documented		Y / N	Y / N	Y / N
h.	Automatic daylight control system reduces the amount of light delivered to the space relatively uniformly as per Section 131(b)			Y / N	
i.	Lighting power reduced by at least 50% in daylit area by windows and at least 65% in daylit areas under skylights.			Y / N	Y / N
j.	Automatic daylight control system reduces the amount of light delivered to the space per manufacturer's specifications for power level versus light level			Y / N	Y / N
k.	Minimum time delay between step changes is 3 minutes to prevent short cycling			Y / N	
l.	Lighting power reduction is at least 50% under fully switched conditions per Standards Section 119(e)1				Y / N
m.	Single- or multiple-stepped switching controls provide a dead band of at least three minutes between switching threshold to prevent short cycling				Y / N

#### Step 2: Simulate dark conditions

a.	Dimming control system provides reduced flicker operation over the entire operating range per Standards Section 119(e)2.		Y / N	Y / N	
b.	Lumen measurements in the space, location of measurements and specific device settings, program setting and other measurements are documented		Y / N	Y / N	Y / N
c.	Automatic daylight control system increases the amount of light delivered to the space uniformly		Y / N	Y / N	Y / N
d.	Minimum time delay between step changes is 3 minutes to prevent short cycling			Y / N	
e.	Single- or multiple-stepped switching controls provide a dead band of at least three minutes between switching threshold to prevent short cycling				Y / N

#### Step 3: System returned to initial operating conditions

Y / N Y / N Y / N

### C. PASS / FAIL Evaluation (check one):

- ☐ PASS: All applicable **Construction Inspection** responses are complete and all applicable **Equipment Testing Requirements** responses are positive (Y - yes)
- ☐ FAIL: Any applicable **Construction Inspection** responses are incomplete OR there is one or more negative (N - no) responses in any applicable **Equipment Testing Requirements** section. Attach additional pages with explanation.



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# Mechanical Forms - Acceptance

**2005 CERTIFICATE OF ACCEPTANCE**

(Part 1 of 2)

**MECH-1-A**

PROJECT NAME		DATE
PROJECT ADDRESS		Checked by/Date Enforcement Agency Use
TESTING AUTHORITY	TELEPHONE	

**GENERAL INFORMATION**

DATE OF BLDG. PERMIT	PERMIT #	BLDG. CONDITIONED FLOOR AREA	CLIMATE ZONE
BUILDING TYPE	<input type="checkbox"/> NONRESIDENTIAL	<input type="checkbox"/> HIGH RISE RESIDENTIAL	<input type="checkbox"/> HOTEL/MOTEL GUEST ROOM
PHASE OF CONSTRUCTION	<input type="checkbox"/> NEW CONSTRUCTION	<input type="checkbox"/> ADDITION	<input type="checkbox"/> ALTERATION
		<input type="checkbox"/> UNCONDITIONED	

**STATEMENT OF ACCEPTANCE**

This Certificate of Acceptance summarizes the results of the acceptance tests related to building mechanical requirements per Title 24, Part 6. (Sections 10-103.b, 121.f, 122.h, 125.a, 125.b, 125.c, 125.c.5, 125.d)

Please check one:

- ☐ I hereby affirm that I am eligible under the provisions of Division 3 of the Business and Professions Code to sign this document as the person responsible for it's preparation; and that I am licensed in the State of California as a civil engineer or mechanical engineer, or I am a licensed architect.
- ☐ I affirm that I am eligible under the exemption to Division 3 of the Business and Professions Code by Section 5537.2 or 6737.3 to sign this document as the person responsible for its preparation; and that I am a licensed contractor performing this work.
- ☐ I affirm that I am eligible under the exemption to Division 3 of the business and Professions Code to sign this document because it pertains to a structure or type of work described pursuant to Business and Professions Code sections 5537, 5538, and 6737.1.

(These sections of the Business and Professions Code are printed in full in the Nonresidential Manual.)

TESTING AUTHORITY - NAME	SIGNATURE	DATE	LIC.#
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**INSTRUCTIONS TO APPLICANT**

*For Detailed instructions on the use of this and all Energy efficiency Standards acceptance forms, please refer to the Nonresidential Manual published by the California Energy Commission.*

Part 1 of 2 - Statement of Acceptance

Part 2 of 2 - Summary of Acceptance Tests



# 2005 ACCEPTANCE REQUIREMENTS FOR CODE COMPLIANCE

## Ventilation System Acceptance Document

MECH-2-A

NJ.3.1, NJ.3.2

Form 1 of 2

PROJECT NAME		DATE
PROJECT ADDRESS		
TESTING AUTHORITY	TELEPHONE	
VENTILATION SYSTEM NAME / DESIGNATION		

**Intent:** Verify measured outside airflow CFM is within  $\pm 10\%$  of the total required outside airflow value found in the Standards Mechanical Plan (MECH-3, Column I), per 121(f).

## Construction Inspection

- 1 Instrumentation to perform test includes, but not limited to:
  - a. Watch
  - b. Means to measure airflow (hot wire anemometer or pitot tube)
- 2 Check one of the following:
  - ☐ Variable Air Volume (VAV) - Check as appropriate:
    - a. Sensor used to control outdoor air flow must have calibration certificate or be field calibrated
      - ☐ Calibration certificate (attach calibration certification)
      - ☐ Field calibration (attach results)
  - ☐ Constant Air Volume (CAV) - Check as appropriate:
    - ☐ System is designed to provide a fixed minimum OSA when the unit is on

**Certification Statement:** I certify that all statements are true on this MECH-2-A form including the PASS/FAIL Evaluation. I affirm I am eligible to sign this form under the provisions described in the Statement of Acceptance on form MECH-1-A

Name: \_\_\_\_\_

Company: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

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# 2005 ACCEPTANCE REQUIREMENTS FOR CODE COMPLIANCE

## Ventilation System Acceptance Document

MECH-2-A

NJ.3.1, NJ.3.2

Form 2 of 2\_

PROJECT NAME

DATE

### A. Equipment Testing

		CAV	VAV
a.	Constant or Variable Air Volume (CAV or VAV) - check appropriate column		
b.	Verify unit is not in economizer mode during test - check appropriate column		
<b>Step 1: CAV and VAV testing at full supply airflow</b>			
1	Drive boxes open (check)		
2	Measured outdoor airflow (cfm)		
3	Required outdoor airflow (cfm) (from MECH-3, column I)		
4	Time for outside air damper to stabilize after VAV boxes open (minutes)		
5	Return to initial conditions (check)		
<b>Step 2: VAV testing at reduced supply airflow</b>			
1	Drive boxes to minimum (check)		
2	Measured outdoor airflow (cfm)		
3	Required outdoor airflow (cfm) (from MECH-3, column I)		
4	Time for outside air damper to stabilize after VAV boxes open (minutes)		
5	Return to initial conditions (check)		

### B. Testing Calculations & Results

	CAV	VAV
Step 1: % Outdoor Air = Measured outside air / Required outside air (Step1:2/Step1:3)	%	%
90% < %Outdoor Air > 110% to 90% = %Outdoor Air = 110%	Y / N	Y / N
Outside air damper position stabilizes within 15 minutes (Step 1:4 < 15 minutes)	Y / N	Y / N
Step 2: % Outdoor Air = Measured outside air / Required outside air (Step2:2/Step2:3)		
90% < %Outdoor Air > 110% to 90% = %Outdoor Air = 110%		Y / N
Outside air damper position stabilizes within 15 minutes (Step 2:4 < 15 minutes)		Y / N

**Note: Shaded areas do not apply for particular test procedure**

### C. PASS / FAIL Evaluation (check one):

<input type="checkbox"/>	PASS: All <b>Construction Inspection</b> responses are complete and <b>Testing Calculations &amp; Results</b> responses are positive (Y - yes)
<input type="checkbox"/>	FAIL: Any <b>Construction Inspection</b> responses are incomplete OR there is one or more negative (N - no) responses in <b>Testing Calculations &amp; Results</b> section. Provide explanation below. Use and attach additional pages if necessary.

# 2005 ACCEPTANCE REQUIREMENTS FOR CODE COMPLIANCE

## Packaged HVAC Systems Acceptance Document

MECH-3-A

NJ.4.1

Form \_\_ of \_\_

PROJECT NAME		DATE
PROJECT ADDRESS		
TESTING AUTHORITY	TELEPHONE	
PACKAGED HVAC NAME / DESIGNATION		
		by/Date _____ Checked Enforcement Agency Use

**Intent:** Verify that under a specific load whether in occupied or unoccupied condition, the system meets a specific sequence of operation.

### Construction Inspection

- 1 Instrumentation to perform test includes, but not limited to:
  - a. None required
- 2 Installation
  - ☐ Thermostat or zone temperature sensor is located within the zone that the HVAC system serves
  - ☐ Thermostat or sensor is wired to the HVAC system correctly
- 3 Programming (check **all** of the following)
  - ☐ Heating and cooling thermostats are capable of a 5°F deadband where cooling and heating are at a minimum (§122b3)
  - ☐ Occupied, unoccupied, and holiday schedule have been programmed.
  - ☐ Pre-occupancy purge (at least lesser of minimum outside air or 3 ACH for one hour prior to occupancy) programmed (§121.c.2)
  - ☐ Set up and set back setpoints have been programmed as required

**Certification Statement:** I certify that all statements are true on this MECH-3-A form including the PASS/FAIL Evaluation. I affirm I am eligible to sign this form under the provisions described in the Statement of Acceptance on form MECH-1-A

Name: \_\_\_\_\_

Company: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

: \_\_\_\_\_

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# 2005 ACCEPTANCE REQUIREMENTS FOR CODE COMPLIANCE

## Packaged HVAC Systems Acceptance Document

MECH-3-A

NJ.4.1

Form \_\_ of \_\_

PROJECT NAME

DATE

### B. Equipment Testing Requirements

### Operating Modes

		<div> <div>Heating load during occupied condition</div> <div>Heating load during unoccupied condition</div> <div>No-load during unoccupied condition</div> <div>No-load during occupied condition</div> <div>Cooling load during unoccupied condition</div> <div>Cooling load during occupied condition</div> <div>Manual override</div> </div>						
Check and verify the following for each simulation mode required		A	B	C	D	E	F	G
<input type="checkbox"/>	1 Supply fan operates continually	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	2 Supply fan turns off				<input type="checkbox"/>			
<input type="checkbox"/>	3 Supply fan cycles on and off			<input type="checkbox"/>				<input type="checkbox"/>
<input type="checkbox"/>	4 System reverts to "occupied" mode to satisfy any condition					<input type="checkbox"/>		
<input type="checkbox"/>	5 System turns off when manual override time period expires					<input type="checkbox"/>		
<input type="checkbox"/>	6 Gas-fired furnace, heat pump, or electric heater stages on	<input type="checkbox"/>		<input type="checkbox"/>				
<input type="checkbox"/>	7 Neither heating or cooling is provided by the unit		<input type="checkbox"/>		<input type="checkbox"/>			
<input type="checkbox"/>	8 No heating is provided by the unit		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	9 No cooling is provided by the unit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
<input type="checkbox"/>	10 Compressor stages on						<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	11 Outside air damper is open to minimum position	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	12 Outside air damper closes completely				<input type="checkbox"/>			
<input type="checkbox"/>	13 System returned to initial operating conditions after all tests have been completed							Y/N

**Note:** Shaded areas do not apply for particular test procedure

### C. Testing Results

Indicate if Passed (P), Failed (F), or Not Applicable (X), fill in appropriate letter

### D. PASS / FAIL Evaluation (check one):

- ☐ PASS: All **Construction Inspection** responses are complete and all applicable **Testing Results** responses are "Passed" (P)
- ☐ FAIL: Any **Construction Inspection** responses are incomplete OR there is one or more "Failed" (F) responses in **Testing Results** section. Provide explanation below. Use and attach additional pages if necessary.

# 2005 ACCEPTANCE REQUIREMENTS FOR CODE COMPLIANCE

## Economizer Acceptance Document

MECH-4-A

NJ.7.1

Form \_\_ of \_\_

PROJECT NAME		DATE
PROJECT ADDRESS		Checked by/Date Enforcement Agency Use
TESTING AUTHORITY	TELEPHONE	
AIR ECONOMIZER NAME / DESIGNATION		

**Intent:** Verify that an HVAC system uses outside air to satisfy space cooling loads when outside air conditions are acceptable.

### Construction Inspection

1 Instrumentation to perform test includes, but not limited to:

- a. Hand-held temperature probes
- b. Multi-meter capable of measuring ohms and milliamps

2 Test method (check one of the following):

- ☐ Economizer comes from HVAC system manufacturer installed by and has been factory calibrated and tested. **Attach documentation and complete certification statement. No equipment testing required.**
- ☐ Economizer field installed and field tested.

3 Installation (check **all** of the following first level boxes)

- ☐ Economizer high limit setpoint complies with Table 144-C per Standards Section 144(e)3
- ☐ System controls are wired correctly to ensure economizer is fully integrated (i.e. economizer will operate when mechanical cooling is enabled), if all boxes are checked for Standalone Control or EMS Control

Stand-alone Control Systems:

- ☐ HVAC unit has two-stage thermostat and the economizer is wired to be the first stage of control
- ☐ First stage of cooling (Y1) from thermostat is separately wired to Y1 at HVAC unit
- ☐ Second stage of cooling (Y2) from thermostat is separately wired to Y2 at HVAC unit
- ☐ Two stages of cooling are not jumpered or wired together

EMS Controlled Systems:

- ☐ Control sequence of operations will allow economizer to be integrated with cooling coil
- ☐ Economizer high limit control sensor(s) are properly installed
- ☐ System is provided with either barometric relief or powered relief (a relief fan or a return fan)
- ☐ Sensor(s) used for economizer high limit control has factory calibration certificate or is field calibrated. Sensors include: outside air sensor only if single-point changeover; both outside and return air sensors if differential changeover control. Field calibration is not necessary if economizer is factory installed.

**Certification Statement:** I certify that all statements are true on this MECH-4-A form including the PASS/FAIL Evaluation. I affirm I am eligible to sign this form under the provisions described in the Statement of Acceptance on form MECH-1-A

Name: \_\_\_\_\_

Company: \_\_\_\_\_

Signature: \_\_\_\_\_

Date \_\_\_\_\_

: \_\_\_\_\_



# 2005 ACCEPTANCE REQUIREMENTS FOR CODE COMPLIANCE

## Economizer Acceptance Document

MECH-4-A

NJ.7.1

Form \_\_ of \_\_

PROJECT NAME

DATE

### A. Equipment Testing

#### Step 1: Simulate a cooling load and enable the economizer (check and verify the following)

- ☐ Economizer damper modulates open to maximum position to provide 100% of design supply air quantity as outside air
- ☐ Return air damper modulates closed and is completely closed when economizer damper is 100% open
- ☐ Economizer damper is 100% open before mechanical cooling is enabled
- ☐ Relief is provided through barometric damper or powered relief (relief or return fan and exhaust damper)
- ☐ Mechanical cooling is only enabled if cooling space temperature setpoint is not met with economizer at 100% open
- ☐ There are no signs of building overpressurization

#### Step 2: Simulate a cooling load and disable the economizer (check and verify the following)

- ☐ Economizer damper closes to minimum position
- ☐ Return air damper opens to normal operating position
- ☐ Relief fan (if applicable) shuts off or barometric relief dampers close. If system uses a return fan, the exhaust damper is shut.
- ☐ Mechanical cooling remains enabled until cooling space temperature setpoint is met

#### Step 3: System returned to initial operating conditions

Y / N

### B. Testing Results

PASS / FAIL

Step 1: Simulate cooling load and enable the economizer (all check boxes are complete)

Step 2: Simulate cooling load and disable the economizer (all check boxes are complete)

### C. PASS / FAIL Evaluation (check one):

- ☐ PASS: All **Construction Inspection** responses are complete and all **Testing Results** responses are "Pass"
- ☐ FAIL: Any **Construction Inspection** responses are incomplete OR there is one or more "Fail" responses in **Testing Results** section. Provide explanation below. Use and attach additional pages if necessary.

**2005 ACCEPTANCE REQUIREMENTS FOR CODE COMPLIANCE****MECH-5-A****NJ.5.1 Air Distribution Acceptance Document****Part 1 of 3**

PROJECT NAME	DATE	TELEPHONE
PROJECT ADDRESS		
TESTING AUTHORITY		
AIR DISTRIBUTOR NAME / DESIGNATION	PERMIT NUMBER	
Checked by/Date Enforcement Agency Use		

**Intent:**

New single zone supply ductwork shall not exceed a 6% leakage rate per §144(k) or §149D i, existing single zone ductwork shall not exceed 15% leakage or other compliance path per §149D ii or §149E.

**Construction Inspection**

- 1 Scope of test – New Buildings – this test required on New Buildings only if all checkboxes 1(a) through 1(c) are checked

**Existing Buildings** – this test required if 1(a) through 1(d) are checked

Ductwork conforms to the following (note if any of these are not checked, then this test is not required):

- |                          |  |
|--------------------------|--|
| <input type="checkbox"/> | 1a) Connected to a constant volume, single zone air conditioners, heat pumps, or furnaces  |
| <input type="checkbox"/> | 1b) Serves less than 5000 square feet of floor area  |
| <input type="checkbox"/> | 1c) Has more than 25% duct surface area located in one or more of the following spaces   |
|                          | - Outdoors   |
|                          | - A space directly under a roof where the U-factor of the roof is greater than U-factor of the ceiling   |
|                          | - A space directly under a roof with fixed vents or openings to the outside or unconditioned spaces  |
|                          | - An unconditioned crawlspace  |
| <input type="checkbox"/> | - Other unconditioned spaces   |
|                          | 1d) A duct is extended or any of the following replaced: air handler, outdoor condensing unit of a split system, cooling or heating coil, or the furnace heat exchanger. |

- 2 Instrumentation to perform test includes:

a. Duct Blaster

- 3 Material and Installation. Complying new duct systems shall have a checked box for all of the following categories a through f.

a. Choice of drawbands (check one of the following)

- |                          |  |
|--------------------------|--|
| <input type="checkbox"/> | Stainless steel worm-drive hose clamps |
| <input type="checkbox"/> | UV-resistant nylon duct ties           |

☐ b. Flexible ducts are not constricted in any way

☐ c. Duct leakage tests performed before access to ductwork and connections are blocked

☐ d. Joints and seams are not sealed with cloth back rubber adhesive tape unless used in combination with Mastic and drawbands

☐ e. Duct R-values are verified R-8 per 124(a)

☐ f. Ductwork located outdoors has insulation that is protected from damage and suitable for outdoor service

**Certification Statement**

I certify that all statements are true on this MECH-5-A form including the PASS/FAIL Evaluation. I affirm I am eligible to sign this form under the provisions described in the Statement of Acceptance on form MECH-1-A

Name:		
Company:		
Signature:		Date:

# INSTALLER CERTIFICATION

Part 2 of 3 MECH-5-A

PROJECT NAME	DATE
SITE ADDRESS	PERMIT NUMBER

**COPY TO: Building Department, Builder, Building Owner at Occupancy, HERS Provider**

## VERIFIED DUCT TIGHTNESS BY INSTALLER

The installing contractor must pressure test every new HVAC systems that meet the requirements of Section 144(k) and every retrofit to existing HVAC systems that meet the requirements of section 149 D or E (see Scope of Test under Construction Inspection)

RATED FAN FLOW (applies to all systems)		Measured Values	
1	Cooling capacity or for heating only units heating capacity		
	a) Cooling capacity (for all units but heating only units) in tons		
	b) Heating capacity (for heating only units) kBtu/h		
2	Fan flow calculation		
	a) Cooling capacity in tons [ _____ (Line # 1a) x 400 cfm/ton]		
	b) Heating only cap. kBtu/h [ _____ (Line # 1b) x (21.7 cfm/kBtu/h)]		
3	<b>Total calculated supply fan flow 2(a) or 2(b) cfm</b>		

## NEW CONSTRUCTION OR ENTIRE NEW DUCT SYSTEM ALTERATION:

Duct Pressurization Test Results (CFM @ 25 Pa)			
4	Enter Tested Leakage Flow in CFM:		✓ ✓
5	Pass if Leakage Percentage <input type="checkbox"/> 6%: [ _____ (Line # 4) / _____ (Line # 3)] x 100	%	<input type="checkbox"/> Pass <input type="checkbox"/> Fail

## ALTERATIONS: Pre-existing Duct System with Duct Alteration and/or HVAC Equipment Change-Out

6	Enter Tested Leakage Flow in CFM: <b>Pre-Test</b> of Existing Duct System Prior to Duct System Alteration and/or Equipment Change-Out.		
7	Enter Tested Leakage Flow in CFM: <b>Final Test</b> of New Duct System or Altered Duct System for Duct System Alteration and/or Equipment Change-Out.		

## TEST OR VERIFICATION STANDARDS: For Altered Duct System and/or HVAC Equipment Change-Out Use one of the following Three Tests or Verification Standards for compliance:

			✓ ✓
8	Pass if Leakage Percentage <input type="checkbox"/> 15% [ _____ (Line # 7) / _____ (Line # 3)] x 100	%	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
9	Pass if Leakage Reduction Percentage <input type="checkbox"/> 60% Leakage reduction = [1 - [ _____ (Line#7) / _____ (Line#6)]] x 100	%	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
10	Pass if all Accessible Leaks are sealed as confirmed by Visual Inspection and Verification by HERS rater (sampling rate 100%)		<input type="checkbox"/> Pass <input type="checkbox"/> Fail
	<b>Pass if One of Lines #8 through # 10 pass</b>		<input type="checkbox"/> Pass <input type="checkbox"/> Fail

## INSTALLER COMPLIANCE STATEMENT

The building was: ☒ Tested at Final ☐ Tested at Rough-in

☒ I, the undersigned, verify that the above diagnostic test results and the work I performed associated with the test(s) is in conformance with the requirements for compliance credit. I, the undersigned, also certify that the newly installed or retrofit Air-Distribution System Ducts, Plenums and Fans comply with Mandatory requirements specified in Section 124 of the 2005 Building Energy Efficiency Standards.

Name:			
Company:			
Signature:		Date:	

**INSTALLER CERTIFICATION****Part 3 of 3 MECH-5-A**

HERS Rater:	Telephone:	Sample Group Number:
Certifying Signature:		Sample building Number:
Firm:		HERS Provider:
<b>Copies to: Builder, Building Owner at Occupancy, Building Department (wet signature), HERS Provider</b>		

For new buildings the HERS rater must test and field verify the first individual single zone package space conditioning equipment unit of each building. After the first unit passes the builder shall identify a group of up to seven package units in the building from which one sample will be selected for testing. If this first sampled unit fails the HERS rater must pick another package unit from the group for testing. If the second unit in the group does not pass the HERS rater must test all package units in the group.

For existing buildings the HERS rater must pressure test one out of every seven units a contractor changes. Same rules apply for sampling above.

This page must be filled out by the HERS rater for all tested and sampled buildings. If the installer has not tested every system and provided a MECH-5-A to the HERS rater sampling must not occur.

The unit was: ☒ Tested ☒ Approved as part of sample testing but was not tested

As the HERS rater providing diagnostic testing and field verification, I certify that the building identified on this form complies with the diagnostic tested compliance requirements as checked ☒ on this form. The HERS rater must verify the distribution system on every new TESTED system to make sure that it is fully ducted and correct tape is used before a MECH-5-A may be released.

<input type="checkbox"/> The installer has provided a completed MECH-5-A for every system in the group
<input type="checkbox"/> New distribution systems are fully ducted (i.e., does not use building cavities as plenums or platform returns in lieu of ducts).
<input type="checkbox"/> In new duct systems, where cloth backed, rubber adhesive duct tape is installed, mastic and draw bands are used in combination with cloth backed, rubber adhesive duct tape to seal leaks at duct connections.

RATED FAN FLOW (applies to all systems)		Measured Values	
1	Cooling capacity or for heating only units heating capacity		
	a) Cooling capacity (for all units but heating only units) [_____ tons x 400 cfm/ton]		
	b) Heating capacity (for heating only units) [_____ kBtuh x 21.7 cfm/kBtuh]		
2	Total calculated supply fan flow 1(a) or 1(b) cfm		
<b>NEW CONSTRUCTION OR ENTIRE NEW DUCT SYSTEM ALTERATION:</b>			
3	Duct Pressurization Test Results (CFM @ 25 Pa) Enter Tested Leakage Flow in CFM:		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
4	Pass if Leakage Percentage <input type="checkbox"/> 6%: [_____ (Line # 3) / _____ (Line # 2)] x 100	%	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
<b>ALTERATIONS: Pre-existing Duct System with Duct Alteration and/or HVAC Equipment Change-Out</b>			
5	Enter Tested Leakage Flow in CFM: <b>Final Test</b> of New Duct System or Altered Duct System for Duct System Alteration and/or Equipment Change-Out.		
<b>TEST OR VERIFICATION STANDARDS: For Altered Duct System and/or HVAC Equipment Change-Out, Use one of the following Three Tests or Verification Standards for compliance:</b>			
6	Pass if Leakage Percentage <input type="checkbox"/> 15% [_____ (Line # 5) / _____ (Line # 2)] x 100	%	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
7	For systems certified by the installer as reducing leakage, pass if Leakage Reduction <input type="checkbox"/> 60%. LeakageReduction = 1 - $\frac{\text{(Line\#5 HERSTestedLeakage)}}{\text{(Line\#6 Installer's CertifiedPre-Test Leakage)}}$ x 100	%	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
8	Pass if all Accessible Leaks are sealed as confirmed by Visual Inspection and Verification by HERS rater (sampling rate 100%)		<input type="checkbox"/> Pass <input type="checkbox"/> Fail
Pass if One of Lines # 6 through # 8 pass			<input type="checkbox"/> Pass <input type="checkbox"/> Fail

# 2005 ACCEPTANCE REQUIREMENTS FOR CODE COMPLIANCE

## Demand Control Ventilation Acceptance Document

MECH-6-A

NJ.8.1

Form \_\_ of \_\_

PROJECT NAME		DATE
PROJECT ADDRESS		
TESTING AUTHORITY	TELEPHONE	
DCV NAME / DESIGNATION		
		Checked by/Date Enforcement Agency Use

**Intent:**

Verify outside air ventilation flow rate can be modulated automatically based on maintaining interior carbon dioxide concentration setpoint.

## Construction Inspection

- 1 Instrumentation to perform test may include, but not limited to:
  - a. Calibrated hand-held CO2 analyzer
  - b. Manufacturer's calibration kit
  - c. Calibrated CO2/air mixtures
- 2 Installation
  - ☐ The sensor is located in the room between 1 ft and 6 ft above the floor
  - ☐ System controls are wired correctly to ensure proper control of outdoor air damper system
- 3 Documentation of all carbon dioxide control sensors includes (check one of the following):
  - a. Calibration method
    - ☐ Factory-calibration certificate
    - ☐ Field calibrated
  - b. Sensor accuracy
    - ☐ Certified by manufacturer to be no more than +/- 75 ppm

**Certification Statement:** I certify that all statements are true on this MECH-6-A form including the PASS/FAIL Evaluation. I affirm I am eligible to sign this form under the provisions described in the Statement of Acceptance on form MECH-1-A

Name: \_\_\_\_\_

Company: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

:-

# 2005 ACCEPTANCE REQUIREMENTS FOR CODE COMPLIANCE

## Demand Control Ventilation Acceptance Document

MECH-6-A

NJ.8.1

Form \_\_ of \_\_

PROJECT NAME

DATE

### A. Equipment Testing

- |  |           |
|--|-----------|
| a. Verify economizer controls disabled                                       |           |
| b. Outside air CO2 concentration (select one of the following)               |           |
| <input type="checkbox"/> Assumed to be 400 ppm                               | _____ ppm |
| <input type="checkbox"/> Measured dynamically using CO2 sensor               | _____ ppm |
| c. Interior CO2 concentration setpoint (Outside CO2 concentration + 600 ppm) | _____ ppm |

#### Step 1: Simulate a high CO2 load

- |                          |   |
|--------------------------|---|
| <input type="checkbox"/> | Outdoor air damper modulates opens per Standards toward maximum position to satisfy outdoor air requirements specified in Section 121(c)4, Table 121-A. |
|--------------------------|---|

#### Step 2: Simulate a low CO2 load, or increase CO2 setpoint

- |                          |  |
|--------------------------|--|
| <input type="checkbox"/> | Outdoor air damper closes to minimum position during occupancy |
|--------------------------|--|

#### Step 3: System returned to initial operating conditions

Y / N

### B. Testing Results

PASS / FAIL

Step 1: Simulate a high CO2 load (check box complete)

Step 2: Simulate a low CO2 load (check box complete)

### C. PASS / FAIL Evaluation (check one):

- |                          |   |
|--------------------------|---|
| <input type="checkbox"/> | PASS: All <b>Construction Inspection</b> responses are complete and all <b>Testing Results</b> responses are "Pass"   |
| <input type="checkbox"/> | FAIL: Any <b>Construction Inspection</b> responses are incomplete <i>OR</i> there is one or more "Fail" responses in <b>Testing Results</b> section. Provide explanation below. Use and attach additional pages if necessary. |

# 2005 ACCEPTANCE REQUIREMENTS FOR CODE COMPLIANCE

## Supply Fan VFD Acceptance Document

MECH-7-A

NJ.9.1

Form \_\_ of \_\_

PROJECT NAME		DATE
PROJECT ADDRESS		
TESTING AUTHORITY	TELEPHONE	
VFD NAME / DESIGNATION		
by/Date _____ Checked Enforcement Agency Use		

**Intent:**

Verify that the supply fan in a variable air volume application modulates to meet air flow demand and operating parameters are within +/-10% of design value and/or setpoint.

## Construction Inspection

- 1 Instrumentation to perform test includes, but not limited to:
  - a. Differential pressure gauge
- 2 Test preparation
  - ☐ Disable discharge air temperature reset sequences to prevent unwanted interaction while performing tests
- 3 Documentation of all discharge static pressure sensors including (check one of the following):
  - a. Factory-calibrated (proof required)
    - ☐ Factory-calibration certificate
  - b. Field-calibrated
    - ☐ Calibration complete, all pressure sensors within 10% of calibrated reference sensor

**Certification Statement:** I certify that all statements are true on this MECH-7-A form including the PASS/FAIL Evaluation. I affirm I am eligible to sign this form under the provisions described in the Statement of Acceptance on form MECH-1-A

Name: \_\_\_\_\_

Company: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

::

# 2005 ACCEPTANCE REQUIREMENTS FOR CODE COMPLIANCE

## Supply Fan VFD Acceptance Document

MECH-7-A

NJ.9.1

Form \_\_ of \_\_

PROJECT NAME

DATE

### A. Equipment Testing

Results

#### Step 1: Drive all VAV boxes to achieve design airflow

2.	Witness proper response from supply fan (e.g. VFD near 100%; variable pitch blades loaded)	Y / N
3.	Controller supply air static pressure setpoint at full flow	
4.	Measured supply fan discharge static pressure	In. WC=
5.	Time for system to stabilize to full flow	Minutes =

#### Step 2: Drive all VAV boxes to minimum flow

6.	Witness proper response from supply fan (e.g. VFD slows fan speed; variable pitch blades unloaded)	Y / N
7.	Controller supply air static pressure setpoint at minimum flow	
8.	Measured supply fan discharge static pressure	In. WC=
9.	Time for system to stabilize to minimum flow	Minutes =

#### Step 3: System returned to initial operating conditions

Y / N

### B. Test Calculations and Results

#### Compare design static pressure with controller setpoint and measured pressure at full flow

1.	Ratio Measured static pressure / controller pressure setpoint at full flow (A.4./A.3.)	%=	
2.	90% < Measured static pressure / Controller pressure setpoint, at full flow (B.2.) < 110%		Y / N
3.	System stabilizes to full flow within 15 minutes (no hunting): A.5. < 15 minutes		Y / N

#### Compare controller setpoint to measured pressure at minimum flow and setpoint at full flow

4.	Controller pressure setpoint at min flow ≤ controller pressure setpoint at full flow (A.7. ≤ A.3.)		Y / N
5.	Ratio Measured static pressure / Controller pressure setpoint at min flow (A.8./A.7.)	%=	
6.	90% < Measured static pressure / Controller pressure setpoint, at min flow (B.5.) < 110%		Y / N
7.	System stabilizes to minimum flow within 15 minutes (no hunting): A.9. < 15 minutes		Y / N

### C. PASS / FAIL Evaluation (check one)

<input type="checkbox"/>	PASS: All <b>Construction Inspection</b> responses are complete and <b>Testing Results</b> responses are positive (Y - yes)
<input type="checkbox"/>	FAIL: Any <b>Construction Inspection</b> responses are incomplete OR there is one or more negative (N - no) responses in <b>Testing Results</b> section. Provide explanation below. Use and attach additional pages if necessary.



## 2005 ACCEPTANCE REQUIREMENTS FOR CODE COMPLIANCE

### Hydronic System Control Acceptance Document

MECH-8-A

NJ.10.1 - NJ.10.5

Form \_\_\_ of \_\_\_

PROJECT NAME		DATE
PROJECT ADDRESS		<div>Checked by/Date Enforcement Agency Use</div>
TESTING AUTHORITY	TELEPHONE	
HYDRONIC SYSTEM NAME / DESIGNATION		

**Intent:** Satisfy HVAC water pumping requirements per Section 144(j).

### Construction Inspection

- 1 Instrumentation to perform tests include, but not limited to:
    - a. Differential pressure gauge
    - b. Portable temperature probe
  - 2 Variable Flow Controls (VFC) and Automatic Isolation Controls (AIC) Inspection
- VFC AIC
- ☐ ☐ Valve and piping arrangements were installed per the design drawings to achieve the desired control
- 3 Supply Water Temperature Reset Controls Inspection
    - ☐ Supply temperature sensors have been calibrated
      - ☐ Manufacturer's calibration certificates (attached)
      - ☐ Site calibration within 2° F of temperature measurement with reference meter
    - ☐ Sensor locations are adequate to achieve accurate measurements
    - ☐ Installed sensors comply with specifications
  - 4 Water-loop Heat Pump Controls Inspection
    - ☐ Valves were installed per the design drawings to achieve equipment isolation requirements
    - ☐ All sensor locations comply with design drawings
  - 5 Variable Frequency Drive Controls Inspection
    - ☐ All valves, sensors, and equipment were installed per the design drawings
    - ☐ Pressure sensors are calibrated
      - ☐ Manufacturer's calibration certificates (attached)
      - ☐ Site calibration within 10% of pressure measurement with reference meter

**Certification Statement:** I certify that all statements are true on this MECH-8-A form including the PASS/FAIL Evaluation. I affirm I am eligible to sign this form under the provisions described in the Statement of Acceptance on form MECH-1-A

Name: \_\_\_\_\_

Company: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

:: \_\_\_\_\_

# 2005 ACCEPTANCE REQUIREMENTS FOR CODE COMPLIANCE

## Hydronic System Control Acceptance Document

MECH-8-A

NJ.10.1 - NJ.10.5

Form \_\_\_ of \_\_\_

PROJECT NAME		DATE				
		<b>System ID</b>				
<b>A. System Type</b>		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
	1 Chilled water					
	2 Heating hot water					
	3 Water-loop heat pump loop					
	4 Other (fill in blank):					
	5 Other (fill in blank):					
<b>B. Select Acceptance Test (check all tests completed)</b>		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<input type="checkbox"/>	Variable Flow Control - Alternate 1 (Flow measurement)					
<input type="checkbox"/>	Variable Flow Control - Alternate 2 (No flow measurement)					
<input type="checkbox"/>	Automatic Isolation Controls					
<input type="checkbox"/>	Supply Water Temperature Reset Controls					
<input type="checkbox"/>	Water-loop Heat Pump Controls - Alternate 1 (With Flow Meter)					
<input type="checkbox"/>	Water-loop Heat Pump Controls - Alternate 2 (Without Flow Meter)					
<input type="checkbox"/>	(Pump) Variable Frequency Drive Controls - Alternate 1 (With Flow Meter)					
<input type="checkbox"/>	(Pump) Variable Frequency Drive Controls - Alternate 2 (Without Flow Meter)					

<b>C. Equipment Testing Requirements</b>		<b>System ID</b>				
Verify and document the following (check applicable tests)		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>NJ 10.1 Variable Flow Control - Alternate 1 (Flow measurement)</b>						
Step 1: Open all control valves.						
a.	Measured system flow (gpm) GPM =					
b.	Design system flow (gpm) GPM =					
c.	System operation achieves design conditions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Step 2: Initiate closure of control valves						
a.	Measured system flow (gpm) GPM =					
b.	Design system flow (gpm) GPM =					
c.	Design pump flow control strategy achieves flow reduction requirements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d.	Ensure all valves operate correctly against the system pressure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Step 3: System returned to initial operating conditions		Y / N	Y / N	Y / N	Y / N	Y / N
<b>NJ.10.1 Variable Flow Control- Alternate 2 (No flow measurement)</b>						
Step 1: Drive all valves shut and dead head pump against manual isolation valve						
a.	Measured pressure across the pump (ft. H2O) $\Delta P$ =					
Step 2: Open manual isolation valve and measure pump DP with control valves closed						
a.	Measured pressure across the pump (ft. H2O) $\Delta P$ =					
b.	Both shutoff pressures are within +/- 5% of each other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Step 3: System returned to initial operating conditions		Y / N	Y / N	Y / N	Y / N	Y / N
<b>NJ.10.2 Automatic Isolation Controls</b>						
Step 1: Drive all valves shut and dead head pump against manual isolation valve						
a.	Measured pressure across the pump (ft. H2O) $\Delta P$ =					
Step 2: Open manual isolation valve and start/stop each chiller or boiler one at a time						
a.	Verify automatic isolation valve opens fully when respective unit is ON	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b.	Verify automatic isolation valve closes fully when respective unit is OFF	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Step 3: Stop all chillers and boilers on the hydronic loop						
a.	Measured pressure across the pump (ft. H2O) $\Delta P$ =					
b.	Both shutoff pressures (1a and 3a) are within +/- 5% of each other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Step 4: System returned to initial operating conditions		Y / N	Y / N	Y / N	Y / N	Y / N

# 2005 ACCEPTANCE REQUIREMENTS FOR CODE COMPLIANCE

## Hydronic System Control Acceptance Document

MECH-8-A

### NJ.10.1 - NJ.10.5

Form      of     

PROJECT NAME		DATE				
<b>NJ.10.3 Supply Water Temperature Reset Controls</b>						
Step 1: Manually change design control variable to maximum setpoint						
a.	Reset temperature setpoint	°F =				
b.	Measured water temperature	°F =				
c.	Water temperature setpoint is reset to appropriate value		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d.	Actual water supply temperature meets setpoint		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Step 2: Manually change design control variable to minimum setpoint						
a.	Reset temperature setpoint	°F =				
b.	Measured water temperature	°F =				
c.	Water temperature setpoint is reset to appropriate value		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d.	Actual water supply temperature meets setpoint		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Step 3: System returned to initial operating conditions			Y / N	Y / N	Y / N	Y / N
<b>NJ.10.4 Water-loop Heat Pump Controls (for circulation pumps &gt; 5 hp) - Alternate 1 (Flow measurement)</b>						
Step 1: Open all control valves						
a.	Measured system flow (gpm)	GPM =				
b.	Design system flow (gpm)	GPM =				
c.	System operation achieves design conditions +/- 5% (Step 1.a./Step 1.b.)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Step 2: Initiate shut-down sequence on each individual heat pumps						
a.	Isolation valves close automatically upon unit shut-down		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b.	Ensure all valves operate correctly at shut-off system pressure conditions		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c.	System flow reduced for each individual heat pump shut down		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Step 3: System returned to initial operating conditions			Y / N	Y / N	Y / N	Y / N
<b>NJ.10.4 Water-loop Heat Pump Controls (for circulation pumps &gt; 5 hp) - Alternate 2 (No flow measurement)</b>						
Step 1: Drive all valves shut and dead head pump against manual isolation valve						
a.	Measured pressure across the pump (ft. H2O)	ΔP=				
Step 2: Open manual isolation valve and measure pump DP with automatic isolation valves closed						
a.	Measured pressure across the pump (ft. H2O)	ΔP=				
b.	Both shutoff pressures are within +/- 5% of each other		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Step 3: System returned to initial operating conditions			Y / N	Y / N	Y / N	Y / N
<b>NJ.10.5 (Pump) Variable Frequency Drive Controls - Alternate 1 (With Flow Meters)</b>						
Step 1: Open all control valves						
a.	Measured system flow (gpm)	GPM =				
b.	Design system flow (gpm)	GPM =				
c.	Design pump power (estimated by motor HP/ motor efficiency x 0.746 kW/HP)	kW =				
d.	System operation achieves design conditions +/- 5% (Step 1.a./Step 1.b.)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e.	VFD operates near 100% speed at full flow		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Step 2: Modulate control valves closed						
a.	Ensure all valves operate correctly at system pressure conditions		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b.	Witness proper response from VFD (speed decreases as valves close)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c.	Time for system to stabilize	Min =				
d.	System operation stabilizes within 5 min. after test procedures are initiated		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Step 3: Adjust system operation to achieve 50% flow						
a.	Measured system flow (gpm)	GPM =				
b.	Measured pump power at full flow	kW =				
c.	%Power = part load kW/full load design kW (Step 3.b. / Step 1.c.)	% =				
d.	VFD input power less than 30% of design		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Step 4: Adjust to achieve flow rate where VFD is below min speed setpoint						
a.	VFD minimum setpoint	Hz =				
b.	Ensure VFD maintains minimum speed setpoint		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Step 5: System returned to initial operating conditions			Y / N	Y / N	Y / N	Y / N

# 2005 ACCEPTANCE REQUIREMENTS FOR CODE COMPLIANCE

## Hydronic System Control Acceptance Document

MECH-8-A

NJ.10.1 - NJ.10.5

Form \_\_\_ of \_\_\_

PROJECT NAME		DATE				
<b>NJ.10.5 (Pump) Variable Frequency Drive Controls - Alternate 2 (Without Flow Meters)</b>						
Step 1: Open all control valves						
a. Visually inspect a few valves to verify that they open						
b. Time for system to stabilize	Min =					
c. System operation stabilizes within 5 min. after test procedures are initiated		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. VFD operates near 100% speed at full flow		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Measured pressure at loop pressure sensor control point	(psi or ft WC)					
Step 2: Modulate control valves closed						
a. Visually inspect a few valves to verify that they close		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Witness proper response from VFD (speed decreases as valves close)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Time for system to stabilize	Min =					
d. System operation stabilizes within 5 min. after test procedures are initiated		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Measured pressure at loop pressure sensor control point	(psi or ft WC)					
f. Measured pressure with valves closed $\leq$ pressure with valves open		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Step 3: System returned to initial operating conditions		Y / N	Y / N	Y / N	Y / N	Y / N

### D. PASS / FAIL Evaluation (check one):

- ☐ PASS: All applicable **Construction Inspection** responses are complete and applicable **Equipment Testing Requirements** check boxes are complete.
- ☐ FAIL: Any applicable **Construction Inspection** responses are incomplete OR there is one or more unchecked box for an applicable test in the **Equipment Testing Requirements** section. Provide explanation below. Use and attach additional pages if necessary.